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of the

Belfast Natural History and Philosophical Society

SESSION 1937-1938.

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EDITED BY ARTHUR DEANE, F.R.S.E., M.R.I.A.,
HON. SECRETARY.

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[Established 1821.]

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Each member has the right of personal attendance at the ordinary lectures of the Society, and the privilege of introducing two friends for admission to such.

Any further information required may be obtained from the Hon. Secretary, at 7 College Square North, Belfast.

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" MOSQUITOES."

Illustrated by Slides and Specimens.

[No Abstract.]

8th February, 1938.

Professor T. Thomson Flynn, President, in the Chair.

THE FLAX FIBRE IN ITS NATURAL STATE.

NATURAL FLAX.

By W. H. Gibson, O.B.E., D.Sc.
(Read by H. B. Bradley, B.Sc.)

From time immemorial, the flax fibre has been extracted from the stem of the flax plant by a double process. The fibre strands are first loosened from the stem by the action of micro-organisms on the tissues immediately surrounding them, and the stems are then broken up into fragments and beaten out, freeing the fibre strands. The process by which the action of micro-organisms is promoted is called " retting," and the subsequent mechanical process is called " scutching."

Retting is performed in two ways:—

i. by steeping in water, or

ii. by strewing the flax stems on the field, when dew supplies the required moisture. Both these processes are extremely primitive, and their origin is lost in antiquity. One may imagine that when the waters subsided from the face of the earth after the flood, and Noah stepped out of the Ark, he found a crop of flax well and truly retted by the immersion, and a process giving such satisfactory results was persevered with from then onwards.

It can certainly be said that the retting process has stood the test of time, and it is quite understandable that many people would be disinclined to depart from it, saying, " What was good enough for Noah is good enough for me."

The process of retting does more than dissolve away the tissues surrounding the fibre bundles or strands. The process is one of fermentation, and secondary reactions take place which result in the production of colouring matters. These colouring matters give to retting water its characteristic brown shade, and they penetrate into the very heart of the fibre deepening the colour and dulling the natural lustre of the flax fibres.

The slide which illustrates the appearance of the cross-section of the flax stem, cut from the middle of the stem, will give you a clear idea of the arrangement of the tissues in the stem, and the portions which are dissolved away in retting may be clearly seen. The outer layer of the flax stem, the epidermis or skin, is not dissolved away during retting. It is a strongly coloured tissue, particularly after retting. It is, as you will have observed, a characteristic of the epidermis of plants to be strongly coloured, for example the bark of trees, or the rind of fruits, and the flax plant is no exception.

Since retting is a wet process, flax has to be dried afterwards, and when this is done the epidermis shrinks on to the fibre strands and adheres firmly to their outer side, thus taking the place of the tissues on that side which had been

dissolved away during the retting. The final result is that in the dried retted flax stem the inner woody core of the stem has been separated from the outer ring made up of fibre strands, but the epidermis has become firmly attached to the fibre layer.

The woody core is now very brittle and the breaking or scutching smashes it into small fragments, and these are removed fairly readily by the blows of the scutching machine blades; but the adherent epidermis is as pliable as the fibre strands themselves and is not dislodged by the blows of the scutching blades with any completeness. Furthermore, the epidermis contains over 10% of a wax, flax wax, resembling bees wax in many ways, and this substance by its lubricating and polishing properties increases the difficulty of removing the epidermis, because the blades can slide over the surface of the fibre strands.

The coating of wax, owing to its inert and resistant nature when treated with the chemicals used in bleaching, makes the removal of colouring matter from the epidermis adhering to the fibre difficult, and it is often possible to detect fragments of epidermis in fully bleached linen, which are still slightly yellowish in hue, as seen under the microscope. One of the problems of linen bleaching is to decolourise these resistant fragments of epidermis or " sprit "as they are called, without doing undue harm to the remainder of the cloth or yarn. Similarly in dyeing, the " sprit " does not absorb the dye as readily as the flax fibres themselves, and such fragments of epidermis are sometimes undesirably evident in the finished material.

The colouring matters produced in the retting process, which penetrate the strands and stain the fibre throughout, also increase the difficulty of bleaching linen. The bleaching agents must therefore penetrate right through the fibre. This is generally called giving the cloth a good " bottoming."

Before the discovery of chlorine by Scheele in the eighteenth century, the process of linen bleaching was a simple one, but very prolonged. It was quite usual for housewives to begin with articles of unbleached linen, and by repeated washings and drying in the open air and sunshine, to approach the whiteness of bleached linen gradually over a period of months.

This simple domestic method was shortened to some extent by the use of alkali boils, such as lime or soda ash boiling, and by " souring " the cloth, at first with buttermilk (which contains lactic acid) and later with the mineral acids, sulphuric or hydrochloric. The use of the powerful bleaching agent, bleaching powder or calcium hypochlorite, made a considerable speeding-up of the bleaching process possible, but until a scientific knowledge of the action of bleaching solutions on the constituents of the vegetable fibres could be acquired, such a powerful reagent was dangerous and was only used guardedly in the light of experience. Even then the liability of errors, resulting in the chemical degradation of the cellulose, known as " tendering," was a serious one. It is only in comparatively recent times that the control of bleaching liquors has been placed upon a fully scientific basis, through the application of our knowledge of methods for determining the reaction of media, that is, the actual acid or alkaline strength as shown by the hydrogenion concentration, usually termed the pH of the medium. Development of the theory and practice of the use of indicators has also been of much value in the control of bleaching.

However, in spite of all the advances which the application of modern chemical science has made possible, the fact remains that the processes of bleaching and finishing linen are rendered more difficult by the secondary changes which occur during the processes of retting and drying, whether water or dew-retting.

There is the further disadvantage that the retting process has to be stopped at just the right point—which is when the fibre strands have been loosened from the woody core, but before there has been any attack on the fibres themselves. Farmers have their own methods and experience in judging when the flax is sufficiently retted, and the still general custom of retting flax in ponds, or dams, by a " leave-it-to-nature " process, results in an irregular, non-uniform, product, and such irregularities are the cause of difficulties in later stages of the manufacture. Further, the retted flax stems are dried in the open air, and with unfavourable weather conditions this may be unduly prolonged and over-retting or even more harmful reactions on the fibre strands may take place, resulting in a partial or total loss of fibre or a reduction in fibre strength and quality.

From the foregoing it will be understood that if any method of separation of the fibre strands from the flax stem which enabled the process of retting to be omitted altogether could be devised, it would not only result in a simplification and cheapening of the production of flax fibre, but it would also present to the linen industry the flax fibre in its natural, unspoiled state and make it possible for the bleachers and finishers to cleanse the fibre of all non-fibrous material, and whiten the fibre without impairing its natural qualities of strength and lustre, without using the present difficult, laborious and often harmful processes. In short we might say that the whole problem of bleaching linen would be changed and greatly simplified. In dealing with retted flax, the bleacher has to destroy or remove a group of substances which are degradation products of the natural constituents of the flax plant, without affecting the cellulose of the flax fibre as far as possible, but in dealing with natural, or unretted, flax the bleacher has to deal with an entirely different set of substances which are themselves natural constituents of the flax plant, and he has not to do more than remove these substances from the fibre, thus making the task of avoiding injury to the cellulose comparatively simple.

It has long been known that in the laboratory the flax fibre strands can be separated by hand from unretted flax straw, and pleasant yellow coloured strands of fibre are obtained. These natural fibre strands can be cleaned by a very simple detergent process which will remove all the adherent tissues from the fibre, and results in the production of the true, natural fibre in all its dazzling whiteness and lustre. This simple process could not be transferred to a large scale mechanical process until a suitable machine was devised and proved practicable by large scale operation. This has been accomplished through the production of the Linra Crimper Breaker, on which world patents have now been secured by the Research Association. This machine breaks the woody core of each flax stem into small pieces from $\frac{1}{4}$ to $\frac{1}{2}''$ in length, and separates it from the adjacent fibre strands. The broken stems can then be scutched in the ordinary way on the Irish scutching wheel, and natural flax fibre is the result. No other breaker in common use is able to break the stems so effectively that good yields of fibre, well-cleaned, can be obtained on the Irish wheel without preliminary retting.

Having been able to produce in this way several tons of natural flax fibre, the Research Association has been actively engaged in determining with the assistance of its member firms, the range of yarns and fabrics which can be produced from natural flax. It has been found that natural flax is particularly suitable for spinning directly without treatment into dry spun yarns ranging up to 18's lea. These dry spun yarns are required in very large quantities for the heavier classes of linen fabrics, and a wide range of such fabrics has been made under ordinary manufacturing conditions. Samples of these goods are on view here to-night. These goods made from natural flax have in many cases been compared with the

corresponding articles made at the present time from retted flax, and in every case the advantages of the natural flax fibre over the retted fibre have been demonstrated.

Dealing first with two dry spun yarns of 18's lea. These yarns were both made from the same crop of Norfolk grown flax. In the one case the flax was retted and scutched with the production of a high grade flax of Courtrai type, and in the other case the flax was merely broken on the crimper breaker and scutched on the Irish wheel without retting. Both these yarns were bleached by the same process, actually a rather mild bleaching treatment. In the case of the natural flax the colour came up white so readily that the two samples were taken out before the end of the process. It will be seen from the samples that the natural flax is fully bleached, while the retted flax is still distinctly grey in shade. It should be pointed out that the retted yarn is of the best type available; it was given a carefully controlled tank retting and is of similar quality to Courtrai flax, which of all retted yarns is easiest to bleach. The comparison is thus a very strict one. Chemical analysis of the two yarns, that is estimation of the chemical attack on the fibre cellulose during bleaching, indicates that the natural flax has been bleached to a good white with remarkably little impairment of the cellulose. Whereas the retted yarn, although of a quality most easily bleached, has already undergone rather more chemical damage than the natural yarn, and as you see requires further bleaching to obtain a satisfactory white, when of course the cellulose would be still more impaired chemically.

A more practicable comparison of the bleaching properties of natural flax, would be against a 16's dew-retted tow, which is the type of heavy coarse yarn commonly in use at the present time. In the unbleached state, this type of yarn has often already suffered more chemical damage (in the retting and drying, of course) than the fully bleached natural yarn. As its bleaching is very difficult you can clearly see that the advantage of the natural flax yarn is a considerable one. It is a very important point that natural flax, which does not undergo any treatment such as retting where chemical attack on the fibre cellulose prior to bleaching may occur, gives the bleacher a better start, so to speak, or a higher margin to work within, and he can produce a good white, without doing the cellulose serious harm. It is a fact that if an unbleached yarn has already suffered chemical damage, say in retting, then it will be more readily damaged in bleaching. Natural flax is thus going to make the task of the bleacher easier and less risky.

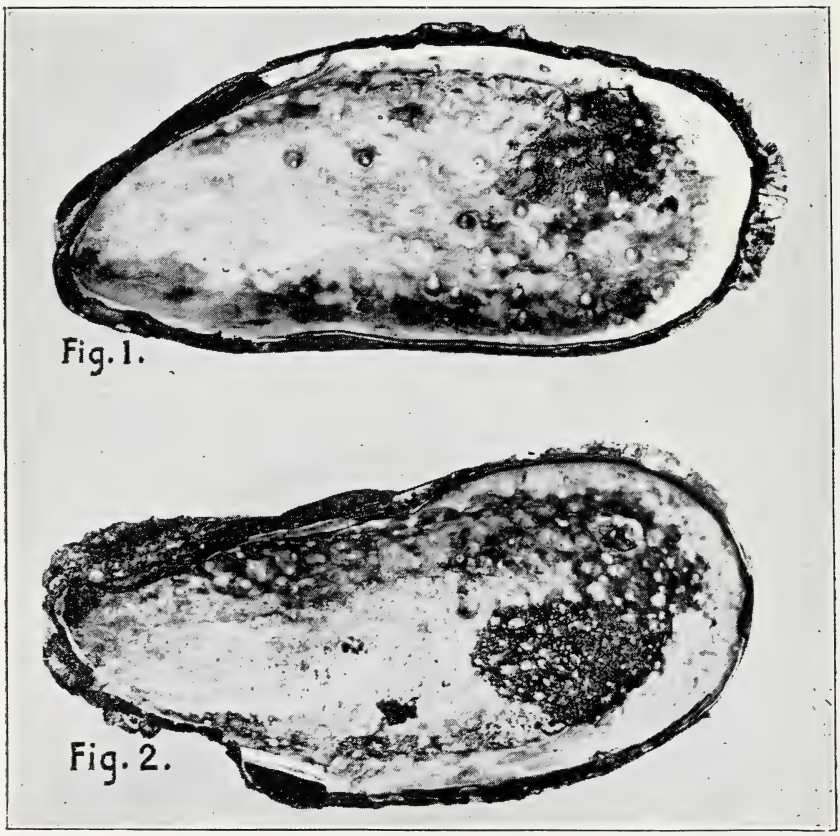
In another example, an endeavour was made to produce a very cheap cloth which might prove suitable for wrapping purposes. This cloth was made from natural yarns, which had only been given a boil in soda. As manufactured, the cloth is not particularly remarkable in appearance. However, it was sent to a laundry to be laundered five times to see the effect, and the result of laundering this cloth five times only is I think sufficiently remarkable. It can certainly be stated that natural flax possesses exceptional launderability, and it is particularly noticeable that the lustre of the fabric has come up in a wonderful way. The other samples on view are canvases of various kinds which have received a number of standard finishing treatments.

Finally, I will conclude by showing you a roller towel, one of a number which have been put in regular use at the Research Institute. One half of this towel is made from ordinary Russian dew-retted tow yarn, the other half is from a corresponding natural tow from Norfolk grown flax. It will be seen on looking through the towel that the half made from natural flax is thoroughly clean when

compared with the Russian, and it is distinctly lighter in colour. This is a difference which still remains after considerable use and a number of washings. It has also been found that the natural flax towel is more rapidly absorbent than the Russian.

It is considered highly probable, although trials have not yet been made, that this extremely clean natural fibre will give much more level dyeing in the case of coloured goods. There is no doubt that ordinarily linen is much more resistant to penetration by dyes than is cotton, but the production of fabrics from natural flax may be a step towards overcoming this difficulty.

It is hoped that enough has been said to give some impression of a development which is expected to have far-reaching effects on the linen industry of this country.



Shell valves of *Modiolus modiolus* infected by the boring sponge (*Cliona*).

8th March, 1938.

Professor T. Thomson Flynn, President, in the Chair.

ON THE RESISTANCE OF *MODIOLUS MODIOLUS* TO INFECTION BY *CLIONA*.

G. Williams and A. E. Needham.

Department of Zooolgy, Queen's University, Belfast.

(Communicated by Professor T. Thomson Flynn.)

Whilst studying the incidence and development of *Pinnotheres pisum* inhabiting *Modiolus modiolus* very large numbers of the latter have been examined (about fifteen hundred). These were all dredged off the entrance to Belfast Lough, where they occur fairly plentifully among the beds of *Pecten maximus*. Of this number only two living horse mussels (specimens A and B. See Figs.) have been found to be infested with the boring sponge *Cliona* although empty shells of *Modiolus* with the characteristic *Cliona* perforations are not uncommon. *Pecten maximus*, as is well known, is particularly liable to infection with *Cliona*, the sponge usually spreading through the shell and forming a large yellow fleshy mass which may ultimately fill the cavity normally occupied by the scallop. Whilst this condition is fairly frequent in *Pecten* in the vicinity of Belfast Lough, apparently nothing comparable has been observed in any *Modiolus*.

In specimen A, although the condition of the shell indicated considerable previous activity, the sponge latterly seemed barely to be making any progress. In specimen B the *Cliona* was clearly flourishing, and it is a debatable point as to what would have been the ultimate result.

Specimen A. (Fig. I). Taken 7.9.37. Shell dimensions:—106·5 mm. x 47·5 mm.

The infection of *Cliona* here occurred only in the right valve, the external surface of which was remarkable for the almost complete absence of the periostracum, the latter being present only near the anterior border. A large number of holes bored by *Cliona* were spread over the posterior two thirds of the valve which was free of barnacles and other sessile organisms. The real interest of the specimens lies in the obvious strenuous resistance of the mussel to the invasion of the sponge for the nacreous layer lining the valve was built inwards as long conical papillae, (Fig. 1.), which suggests that as the *Cliona* forced its way inwards, fresh deposits of the nacreous substance were continually added. This resulted first in the development of small mound like nodules of which many may be seen, and finally in the development of turret like projections, the longest of which projected inwards to an extent of approximately 5·6 mm. Six of these large projections actually penetrated into the posterior adductor muscle, but it is not known whether these impaired the grip of the muscle on the valve. Close examination of the tip of many of the processes revealed the presence of a minute aperture, which communicated with a cavity inside the projection. On filing down one of the latter to about half its length it

was found that the thickness of the wall (0·8 mm.) was almost equal to the diameter of the cavity (0·9 mm.). It would appear that in this specimen the mussel was successfully combating the inward growth of the *Cliona*.

Specimen B. (Fig. 2). Taken 14.10.37. Shell dimensions:—117 mm. x 54 mm.

As in specimen A. only one valve was infected with the sponge, but in this case it was the left one. Practically the entire surface of the infected valve was covered with young barnacles and serpulids which had presumably settled since the invasion by the sponge. When some of these were removed in order to examine the living sponge, which was present in abundance, it was seen that the reduction of the periostracum was considerably less than in specimen A.

An examination of the internal surface showed that the infection in this case was greater, covering a larger area and with more numerous papillae, although, from the smaller size of the latter, possibly of shorter duration. The pearly turret like processes although uniformly smaller than in specimen A were extremely numerous (Fig. 2), and nearly all showed the perforated tip. The large posterior adductor muscle impression in specimen B was covered with numerous fine projections, but no very large ones occurred. There was, however, a well marked ridge running round the margin of the impression, where considerable increase in the deposition of nacreous material had apparently taken place.

There can be no doubt that in both specimens A and B the sponge *Cliona* was attempting to form fleshy masses inside the shell valves. From our examination it would appear that it was being defeated, in the case of specimen A, by the continuous secretion of nacre, but the result in specimen B was not quite so certain since the sponge was obviously in an active condition throughout the shell. This active resistance by *Modiolus* is no doubt one of the reasons for the infrequency of obvious infestation as contrasted with the high incidence in *Pecten maximus*, a mollusc of much the same size and abundance and occurring in the same locality, but which, judging by the appearance of infested shells, lacks such powers for nacreous secretion.

On the other hand it is equally possible that this difference between *Modiolus* and *Pecten* depends on the protection afforded the former by its well developed periostracum, which by contrast is poorly developed in *Pecten*. The two specimens of *Modiolus* lacked the periostracum over the area of the shell infested with *Cliona*. Such an occasional means of ingress might well be provided through damage accidentally brought about by the heavy toothed dredges used by fishermen dredging for *Pecten maximus* on the *Modiolus* beds. In this connection it is interesting to note that a close relative of *Modiolus*, the Mediterranean "Date Shell," *Lithodomus* (*Lithophaga*), which itself bores into calcareous rock by means of an acid secreted from a gland in the mantle, has an unusually well developed periostracum as a protection against its own acid[1]. These facts would appear to support the theory that *Cliona* bores by means of an acid secretion rather than the alternative view that it is by mechanical use of the sponge spicules.

Summary.

The low incidence of infestation of *Modiolus modiolus* by the boring sponge *Cliona* (two in fifteen hundred specimens) may depend on two factors, first the protection afforded by the well developed periostracum against initial penetration by the sponge and, secondly, once the sponge has penetrated in this way, the resistance to further inroads by an abnormally increased deposition of nacre.

1. Marine Boring Animals. W. T. Calman. 1936.

11th January, 1938.

Prof. I. G. LLUBERA, M.A., Litt.D.

"CATALAN MEDIEVAL ART."

Illustrated by Slides.

[No Abstract.]

25th January, 1938.

"LIFE HISTORY OF TROUT IN TASMANIA."

Film Exhibition by Prof. T. Thomson Flynn, D.Sc., M.R.I.A.

8th March, 1938.

Mr. Arthur Deane, M.R.I.A.

"THE GREEN PLANT."

Illustrated by Slides.

[No Abstract.]

ARCHAEOLOGICAL SECTION.

EXCAVATIONS AT MOURNE PARK.

By O. Davies.

The monument of Mourne Park lies on a fertile plateau sheltered on the north by the Mourne Mountains, about two miles north-west of Kilkeel[1]. It had been visited at various times by archaeologists, but they could not classify it with certainty, owing to the removal of stones for the demesne-wall at the time of the famine and because much of the site was covered by the upcast of a deep ditch. This divides an arable field from a patch of boulder-strewn waste, and though certain lines of boulders could be traced, it was impossible to determine the form of the cairn. The purpose of the excavation was consequently to discover the nature of the monument, and we undertook it from a sense of duty rather than in the expectation of finding interesting or undisturbed features.

The monument lies in the demesne of Lord Kilmorey, who most kindly granted permission, as did his tenant, Mr. A. Annett, of Kilkeel. We were assisted in every way by the kind offices of Mr. R. J. M'Combe, the estate-agent. The working-party consisted of Mrs. Cowan, Miss Gaffikin, Mr. R. H. Common and the author. The excavation was carried out in the second half of March, 1938, with the aid of a grant from the archaeological section of the Belfast Natural History and Philosophical Society and from the Government unemployment fund. Finds have been deposited in Belfast Museum.

When we started work, we were uncertain whether the entrance was on the north or the south. We began at what might be the portal, beside a tall stone; and so it turned out to be. Though what was later discovered to be the forecourt was sealed with cairn, this sealing gave place in the immediate vicinity of the portal to a paving of small slabs. Below some surface-boulders were the bones of a sheep, deposited probably in recent times[2], and some pine-charcoal (inv.no.23)[3]. The dark earth between the jambs was loose filling, containing wind-blown dust, and covering a deep pit into till (section AE). There was, however, a proper stone packing round the north side of the west jamb, with a very large stone set diagonally to the axis of the chamber. There had clearly been disturbance in the portal, as on the west side the grey clay, absent on the east, was overlain by a thin yellow layer which must be till thrown up; at some depth on the east side was found a piece of iron, and the top of the till was irregular, with a slight pit on the west. But the narrow steep-sided pit, lined with yellow-brown or grey clay, can hardly have been made by a modern tomb-robber, who would have found difficulty in digging thus to this depth; and though it seems later than the grey floor through which it apparently cuts, it resembles more an ancient offering-pit, dug perhaps out of reverence when the reoccupiers of the tomb abandoned it. It may perhaps be compared to the pits at Browndod[4].

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(1) O.S. Down 55, plan 11, trace 3 ; altitude 180 ft.

(2) Section AE. There was a further sheep-burial (inv.no.96) just outside the eastern sidestone of Chamber I.

(3) The charcoal from this monument was kindly examined by Mr. M. Y. Orr. Pine was identified at this place and in brown earth near the surface in the centre of the cairn. Neither of these deposits can be regarded as certainly neolithic, and pine is seldom found in neolithic horizons, probably because it grew too far down in the swamps and forests, while primitive man used the scrub on the edge of the forest, mainly hazel and oak.

(4) *B.N.H.P.S.*, (1934/5) p. 70.

MOURNE PARK

0 5 10 15 20
FEET

	BLACK EARTH
	BROWN EARTH
	YELLOW-BROWN EARTH
	MIXED SOFT YELLOW EARTH
	GREY OR WHITISH SAND
	REDDISH-YELLOW CLAY
	STONE ON SECTION
	SECTION-CROSS
B	TURF-LEVEL AT B

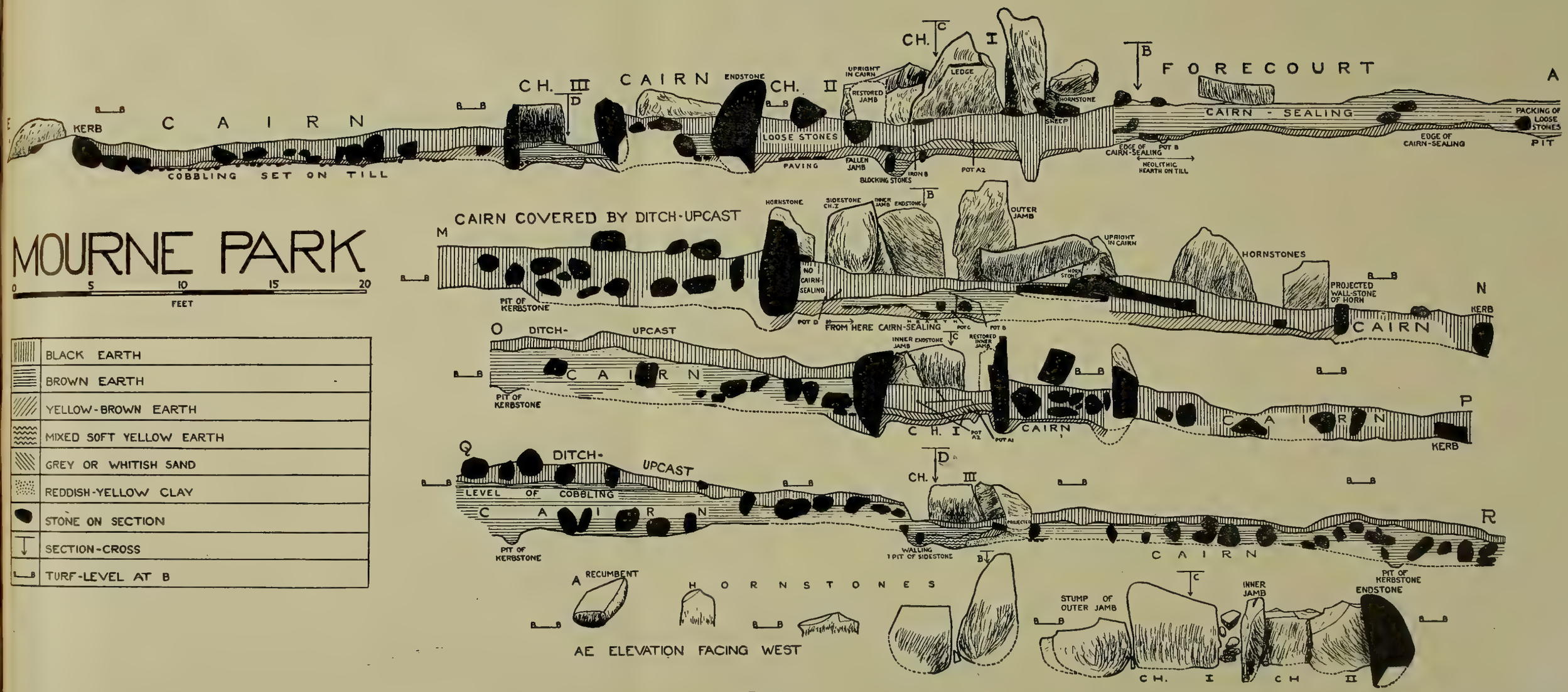

Fig. 2.

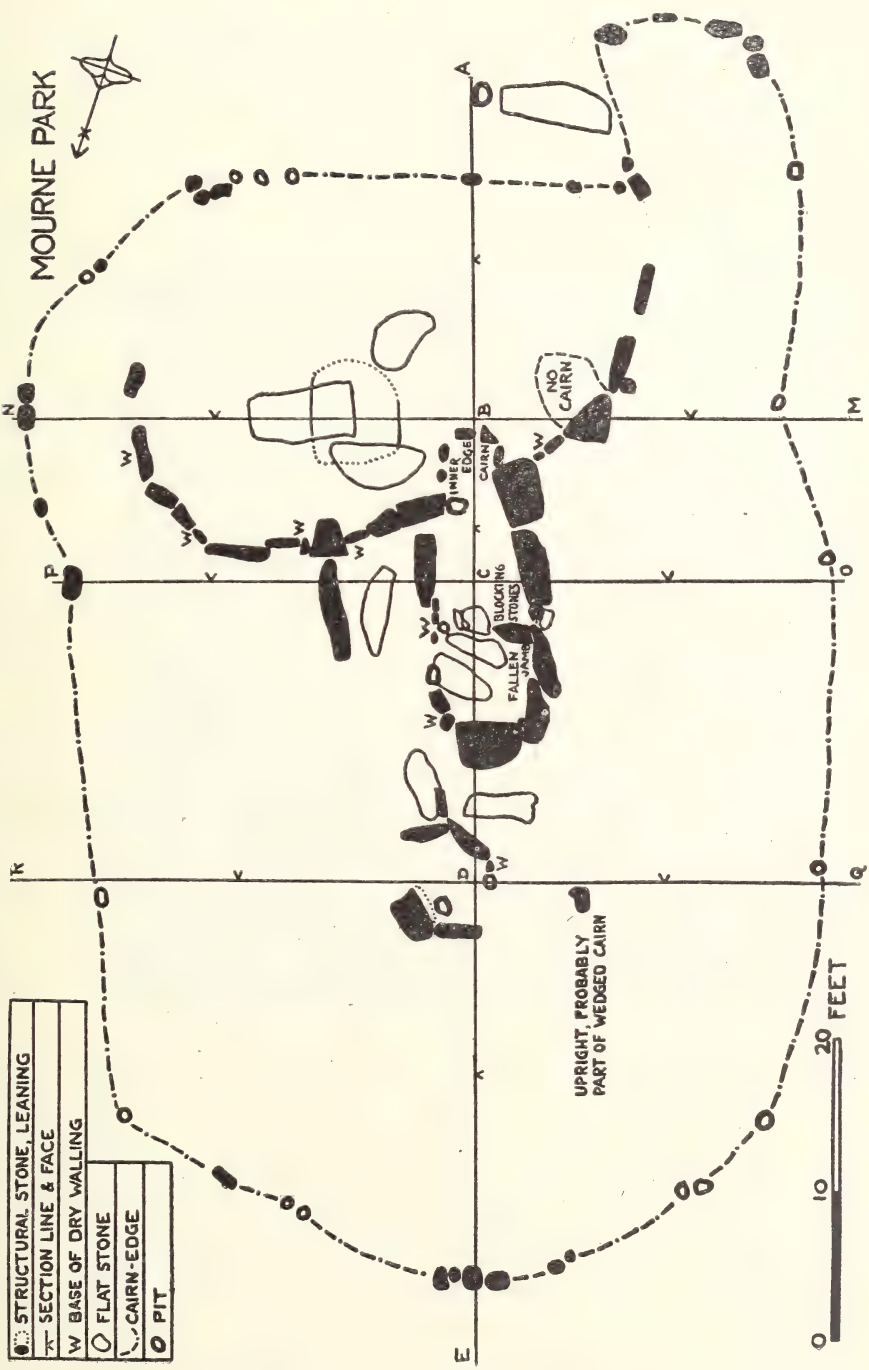
MOURNE PARK
STRUCTURAL STONE, LEANING
SECTION LINE & FACE
W BASE OF DRY WALLING
FLAT STONE
CAIRN-EDGE
PIT
INNER EDGE
CAIRN
NO CAIRN
BLOCKING STONES
FALLEN JAMB
UPRIGHT, PROBABLY PART OF WEDGED CAIRN
0
10
20 FEET

Fig. 1.

The portal is flanked by two deeply sunk jambs, of which the eastern stands to a height of eight feet above till-level, while the western has been smashed off (section AE, west elevation). The large block lying close to the eastern jamb in the forecourt may have been the lintel. It is a split boulder six feet long. Its present west end is roughly shaped so that it would fit the shoulder of the eastern jamb, and in being thrust off it must have been overturned. Its split side would thus have been underneath and its rounded face exposed.

On each side of the portal we found upright stones of the horns. These are fairly low (AE west elevation, section MN), and between them are small long slabs on edge, the base of the dry walling which held back the cairn (Plate I 1). This facing was however absent in the outer part of the west horn, where cairn had tumbled over into the forecourt at a high level. The hornstones are irregularly spaced and occasionally contiguous. The second on the west is wedged behind with a pillar-stone in the cairn.

The hornstones are bedded into till and packed round with small wedges. They form an irregular and rather flattened semi-circle, of a type believed at Ballyalton to be late in the series[5]. They apparently did not extend as far as the cairn-facade on either side; on the west the end of the horn was continued by roughly built cairn-edge.

The forecourt resembles that of Ballyalton also in another feature. In the centre of the outer edge was found a slight pit in till (section AE), and round it stones packed up into a rough pyramid, smaller near the edge and larger towards the centre. These stones were probably intended to support a standing stone, perhaps the huge recumbent lying close to them (AE west elevation). At Ballyalton was a standing stone, set fairly high and packed round, in a corresponding position.

The forecourt was sealed with largn cairn-stones, among which was brown earth, blacker near the surface (sections AE MN). The edge of this sealing was traced by a number of stones and pits. Immediately beyond it the till dips, probably owing to erosion on an exposed surface. The cairn extends across the forecourt as far as a line at right angles to the axis of the chambers, and without regard to the corner-facades, one of which it overlaps, while the other stretches beyond it. On the site of the cairn-edge was found a small flint-flake (inv.no.104). In the north-east part of the forecourt the surface is rather hollow, and in front of the eastern jamb are four large slabs (sections AE MN), one, as already explained, probably the lintel, and the others roof-stones. The cairn sealing seems to have been mainly removed in this part, and the roof-stones were perhaps dumped here to be broken up. In a crevice in the cairn-sealing was found a piece of glass-slag[6], and above it scraps of pot C (inv.no.102) and burnt bone (inv.no. 105), presumably outcast from a chamber. The principal finds from this level were however on the south-west (see plan and section MN), where over a small area the cairn-sealing was absent, and fragments of the medieval pot D, small flint flakes (inv.nos.86, 98) and a little oak charcoal (inv.no.99) were found scattered to some depth in soft brown earth, without however any distinct habitation-layer save a slight cobbling. This pottery is clearly intrusive, and at Mourne Park, as at many other horned cairns (e.g., Browndod, Aghanaglack), later peoples seem to have squatted under the shelter of the stones bounding the forecourt.

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(5) *B.N.H.P.S.*, (1933/4) p. 79.
(6) Inv.no.110.

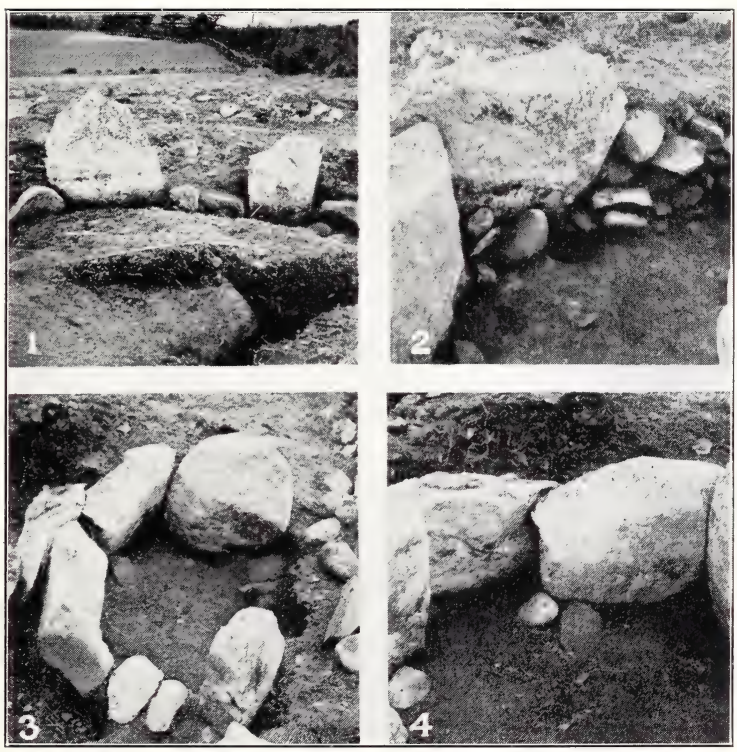

Plate I. MOURNEPARK.

1. Eastern Horn. 2. West side of Chamber III, shewing dry walling,
3. Chamber II, from above on the south. 4. Chamber II, Western sidestones

Near the base of the cairn-sealing were found neolithic sherds (inv.no.106, pots B and C), and oak charcoal (inv.no.107). This shows that the sealing was constructed not long after the monument was built, presumably when the interment was deposited in the grave.

Below the cairn-sealing was a thin layer of yellow-brown clay (sections AE MN), probably a natural subsoil overlying the till. Near the portal it was roughly paved, and on all parts of its surface was charcoal (inv.-no.88). In particular, we found a thick hearth-layer from 3 ft. south of B to 1 ft. west and 2½ ft. east, on a rather uneven surface. It contained a good deal of pot B (inv.no. 91, 100, 109) and oak charcoal (inv.nos. 92, 101, 108).

Chamber I is bounded by two sidestones, of which the eastern is not contiguous with either jamb. The gap on the north is filled by dry walling, which passes behind the pit of the missing jamb, as far as the pit of the sidestone of Chamber II. The south-east corner had no walling, but was banked up with brown clay containing small stones. There is some walling also in the north-west corner. The eastern sidestone is dug into soft yellow drift (section OP), the line of disturbance being traceable by slight discoloration. The western stands in a pit filled with wedge-stones and black earth, and lined with rough cobbling.

Chamber I was probably roofed not by corbelling but with cross-blocks, which rested on the ledge of the eastern sidestone (section AE). This ledge slopes northwards to be roughly level with the top of the western sidestone, as far as the tops of the jambs of the inner portal. Several of the stones lying loose on the cairn or in the forecourt would have covered the span of five feet. In no other way can I understand how the pointed eastern sidestone can have taken a roof, though similar ledges to support roof-stones have not been observed elsewhere.

The upper part of Chamber I was filled with closely packed stones and black earth. In the south and centre of the chamber were found among the stones many minute sherds of pot A and a piece of iron[7]. On the north, as far as C, the packing extended down to till, and the yellow subsoil, which contains many boulders, must have been reset; it has some hazel charcoal (inv.no.30). This deep-level packing was clearly meant to seal the inner portal, and perhaps to hold apart the jambs in lieu of a sill. At the corners was a paving of thin slabs just above till, perhaps the remains of the original floor.

Below the black layer is a thin grey stratum, containing a good many small iron-age sherds of pots A1 and A2, hazel (inv.nos. 17, 22, 55) and oak (inv-no. 22, 55) charcoal with a scrap of willow-poplar (inv.no.55), and two fragments of probably human bone. There was another piece of human bone on a gravel bed on the surface of the yellow-brown beneath a large stone (inv.no.67); but nearly all the bone from this monument was found in Chamber II. The grey layer overlay a yellow-brown clay, which may be natural subsoil, into which a certain amount of hazel charcoal (inv.nos. 32, 79) and a small flint flake probably struck from a pebble (inv.no.74) had become embedded.

In view of the fact that all the pottery from Chamber I seems to be post-neolithic, we must assume that the chamber was cleaned out for reoccupation, as were apparently those at Goward[8]. The paving-stones in the corners, and especially the one sealing bone 67 seem to be remnants of the neolithic floor; but the grey clay, absent in other parts of the monument, is probably the reoccupation-layer. This reoccupation is most likely to have taken place while the chamber was roofed; but to enter then it would be necessary to remove the sealing of the

(7) Inv.no.8. A short rusted bar of rectangular section, with perhaps a chisel-blade at one end. Measurements 3 by ·8 by ·5 ins.

(8) *B.N.H.P.S.*, (1932/3) p. 90.

portal, which would account for the disturbance there. The inner portal may have remained sealed, and the existence of Chamber II have been unsuspected, as save for a glass bead at a high level in the black earth[9], it had no signs of iron-age occupation; the disturbance in it may have been due rather to recent curiosity.

Of the inner portal leading to Chamber II only the western jamb was standing (pl. I 3); it is dug into till and wedged with several small stones. Its base projects to the rear, so that the nose of the south-west sidestone of Chamber II rests on it and nearly touches the sidestone of Chamber I (AE west elevation). We found the pit of the eastern jamb, probably the stone lying at a high level across Chamber II (section AE). Between the jambs, set into a pit in till, were two flat slabs, acting almost as a rough threshold.

Chamber II is bounded on the west by two sidestones, resting on small wedge-stones which are deeply sunk into till[10], and on the north by a massive split boulder, wedged in and acting as end-stone (section AE). On the east we found the pit of another upright descending four inches into till, the gap on each side of it being filled with dry walling, of which the foundation-courses survive. This walling is not built vertically, but banked up from the edge of the end-stone. In the forecourt was found a shale block two feet square, broken by blasting; it looked like the top of a sidestone, and may have belonged to Chamber II.

Chamber II was perhaps roofed by corbelling, as the sidestones are lower than the jamb and end-stone (AE west elevation), and on the last is a slight shoulder which could support a corbel. A large block lying in the chamber (section AE) and others behind it could have been corbels.

The upper part of Chamber II was filled with black earth containing loose boulders. These did not seem to be a sealing like those of Chamber I, but due to disturbance and refilling. Below them, on the yellow-brown, were three paving-stones alongside the end-stone and one in the south-west corner, but they were absent from the west central part of the chamber, in the filling of which were tumbled slabs resembling paving-stones disturbed. Beneath one of the paving-stones at the north end were human bones and hazel charcoal (inv.no.18), resting on a small pocket of yellowish gravel measuring 10 ins. north-south and 2 ins. east-west, let into the yellow-brown sand which otherwise contains no gravel or bones. A good many other human bones (inv.nos. 58, 59, 60, 61, 62, 63) in no order were found among and under the stones sealing the north side of the inner portal. It was clear that these bones could not have reached their positions either if a corpse had been laid in the chamber, or if, as was the usual custom at this time, the remains of the pyre had been shovelled in haphazard. We were forced therefore to conclude that the flesh had been removed and the bones dismembered before they were deposited.

Professor T. Walmsley reports as follows: " The human bones contain a large amount of water; they are very soft and easily rub down to a powder. They char on heating, both on the surface and in their substance; but I am of opinion

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(9) Inv.no.31. Bead, of opaque blue glass, of the form of a flattened sphere, with irregular edges. External diameter ·23 ins. diameter of cylindrical perforation ·17 ins., height ·19-·23 ins. I submitted the bead to Mr. Horace Beck, who writes as follows : " The bead is made of the same glass as many that are now being found in Ireland. I think the colouring is cobalt. Until recently this type has been attributed to the early iron-age, but fresh evidence seems to prove that it is more likely to date to the VIII-XII centuries A.D., as the only dated sites in which these beads occur are of that period."

(10) See AE west elevation, pl. I 2. The south-west sidestone is bedded on yellow-brown, and even its wedge-stones are hardly set into till. The north-west sidestone is much deeper set.

that they are from an incineration-burial, the incineration of which was very incomplete. Some appear to me to have marks of burning, and in parcels 18 and 62 are numerous fragments of wood-charcoal. I can recognise parts of the skull-bones, vertebrae, limb-bones, and several teeth; there are no duplicate parts. I can discover no part which enables me to say more than that the remains are of an adult human subject."

It is unfortunately impossible to do more than make suggestions as to the burial-ritual here employed. The stripping of the flesh suggests cannibalism, the purpose of which is, among most human races, not to obtain food but to incorporate the spirit of the dead man. Professor Walmsley suggests that the bones have been subjected to a token-burning. The incompleteness of the incineration is shown by the survival even of the enamel of the teeth, which is seldom found except in inhumations. In general, the earlier cremations were fairly thorough; and it was in the late bronze-age that men became more careless, and the surviving bones are larger. The ritual at Mourne Park therefore does not stand in the normal Irish megalithic tradition. I know no parallels to a token-burning in Ireland; but it is advocated for the Homeric age by one school of scholars[11], who maintain that it was usual to toast rather than to cremate the dead at that time.

These bones rested on the top of a yellow-brown floor containing hazel charcoal (inv.no.64). At its base, immediately on till, was a second paving of flat slabs (section AE), absent in the western part of the chamber where disturbance seemed to have taken place.

In the neighbourhood of the monument plenty of large granite boulders are obtainable, and as at Clontygora and Clady Halliday they were largely used, the builders apparently liking their rounded forms. As at Clontygora, they were normally split longitudinally, to give one flat face. Only one upright was of quarried shale, presumably from the beds into which the Mourne granite was intruded. The following table shews the material of the uprights:—

West hornstone 3	quarried shale
,, 2	quarried granite
,, 1	boulder granite
East hornstone 2	quarried granite
,, 1	boulder granite
West entrance-jamb	? boulder granite
East ,,	quarried granite
Chamber I, west sidestone	boulder granite
,, east ,,	quarried granite
Inner portal, west jamb	quarried granite
,, east jamb	quarried granite
Chamber II, south-west sidestone	quarried granite
,, , north-west ,,	boulder granite
,, , east ,,	? shale (see above p. 22)
,, , endstone	boulder granite

Of the cairn the foundation-courses survive, especially on the west, where they were protected by upcast from the ditch and by other stones piled above (see all cross-sections). At the top of the original cairn on section QR was a light brown layer with what seemed to be rough cobbling, presumably an old surface, and shewing that the cairn had been partially removed long ago, presumably before

(11) Cauer, *Grundfragen der Homerkritik*, p. 277.

the building of the demesne-wall. On this cobbling were several bones (inv.nos. 6, 52, 53, 95) and modern sherds[12]. At the back the cairn seemed built on a rough cobbling set into till (section AE), perhaps to prevent the heavy stones sinking into the soft drift. The cairn-stones are large rounded boulders, wedged together so that trenches could be dug only with difficulty, and it was not possible to determine the till along their whole lengths. The earth among the stones was black or brown, varying presumably with the conditions of vegetation on various parts of the monument.

The kerb consists of rounded boulders no larger than many of the cairn-stones, and was consequently difficult to plan. On some sections however (section OP) we found slight pits in till, on others (section AE) we plotted the last cairn-stone bedded on to till, and we have thus determined the line shewn on the plan. On the east the kerb seems marked by a slight ridge on the surface, it not being considered worth while to dig out the edge-stones, where the cairn was low. The back of the cairn is thus rounded, like Ballyalton, whereas at Clady Halliday and Browndod it is angular. The cairn is also unusually short, and a circle described with point D as centre would coincide with the whole of the back-kerb and with the front portal, giving a circular monument with horns excrescent.

East of Chamber I are two large stones in the cairn (section OP). One is a massive recumbent, not deeply bedded, and probably a fallen roofstone. The other is bedded on black just above till, beside the pit of the hornstone (which appears on section OP). It is surrounded by cairn-material, and if it had any structural purpose, it must have been a double walling, as at Goward. But an outer walling of a chamber normally runs to join the inner and not parallel to it, and is usually found on both sides (though at Largantea was double walling only on one side); so it is more probable that this stone was a discarded sidestone used in the cairn.

At the point which, but for the horns, would be the centre of the cairn is a third chamber, polygonal in shape, and bounded by four uprights, sunk into till (pl. I 4). On the north-west we found a slight pit, above which walling was absent, so probably of a sidestone now removed. Between the pit and the south-west sidestone walling survived. On the south-east I could roughly trace the line of rise in till, indicating the edge of the chamber; but disturbance in the cairn had removed both sidestone and walling.

The surface of this chamber was hollow, so it was probably once covered by a capstone (section AE QR). In the top of the fill was black and brown earth, and below it on the south and east orange and white sand, probably natural subsoil, underlying a thin yellow-brown floor containing hazel charcoal (inv.no.90). The rest of the chamber had been disturbed, and above the till was mixed yellow and brown earth. In the north-east corner we found a deep pit through the mixed stratum, to a depth of 1 ft. 1 in. below the surface of the till. It was filled with soft black earth, with many loose stones at the base. In it was an animal bone (inv.no.93, ox or sheep). It looked like a rabbit-burrow; but in that case the stones could hardly have slipped in. It may possibly have held an urn now removed.

It is impossible to regard as secondary this chamber, situated in the centre of a wedged cairn which may have risen as much as 15 ft. above it. Nor is it likely to have contained a corpse, which could have been deposited in it only during the process of construction, as no traces of bone were found. The burial was in Chamber II; Chamber III must have had ritual significance. Its central position

(12) One may mention on the cairn, between East hornstone 1 and 2, a large flint flake apparently struck from a pebble (inv.no.103).

is therefore important, and we are reminded of the ox-burial in the centre of the circular cairn of Bryn Celli Ddu[13]. The shortness of the Mourne Park cairn suggests contact with a round-cairn culture; and an Anglesey idea may have been grafted on to a horned cairn by immigrants across a comparatively narrow expanse of water.

In general, Mourne Park is probably to be placed late in the horned-cairn series. The parallels, such as the flattened horns and the absence of a third chamber, are mainly with Ballyalton, which yielded developed neolithic pottery and a bowl which is almost to be classed as a food-vessel. In various details Mourne Park heralds the dolmen-class of cairns, which should probably be assigned to the full bronze-age. The roof of Chamber I seems to have been tilted backwards, whereas on earlier monuments it was flat. The sidestones are beginning to give place to dry walling, while the jambs and endstone are exaggerated, as in the tripod-dolmen. The pottery is still "neolithic;" but the undecorated "neolithic" pottery of Ulster perhaps lingered long, and it may well be found in dolmen-monuments, even in the coast-lands.

In Chamber I was found a large number of small crumbly sherds, mostly reddish in colour, but very difficult to assign. I propose to distinguish two pots:

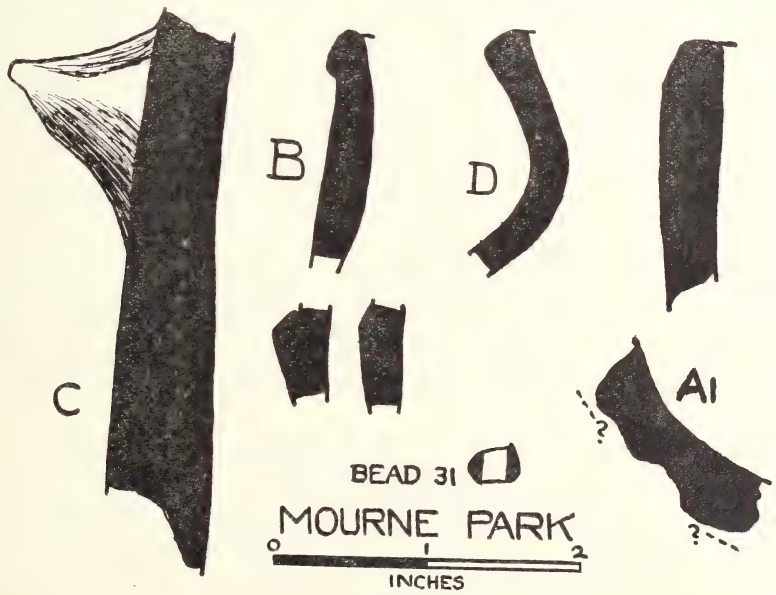

Fig. 3

A1 contains fragments from all parts of the chamber[14], both from the grey and the black layers. It was a large coarse bowl or cooking pot, from its texture almost certainly iron-age, as I do not know any neolithic parallels. The outer surface is black or reddish, rather hard and gritty, unornamented but fairly regular; the inner is dull red near the rim, black at the base; the thickness is about ·4 ins., or more at the base. The rim is simple. On one piece is a

(13) Hemp, *Archaeologia* (1930), p. 179. One can also compare the burnt area behind the chambers at Cashtel yn Ard horned cairn (Fleure, *Antiquaries Journal* xvi (1936), p. 373), and the domed structure in a similar position in the long barrow of Notgrove (Clifford, *Archaeolotgia* lxxxvi (1937), p. 119).

(14) Inv.nos. 2, 4, 10, 14, 33, 39, 97.

considerable interior curve; as the outer surface is not preserved, it is impossible to tell whether it belonged to the base or to a shoulder, but the former is more probable.

The fragments which I have assigned to A2[15] come entirely from the grey layer. They are much finer, though no pieces of significant shape are preserved; but as on some is a fairly steep curve, the pot must have been small. The thickness of most pieces is less than ·2 ins., on one it rises to ·3 ins. The surface is reddish, hard and rather gritty, but regular and smooth. The ware does not feel neolithic.

From the forecourt I have distinguished portions of three pots. B is an undecorated shouldered neolithic bowl[16], of which not more than a quarter was recovered, and the smallness of the sherds made it impossible to find many joins. The outer surface is red, the inner grey and well polished; the biscuit is fine. The thickness averages under ·3 ins., though on a few pieces of neck it sinks to ·12 ins.; that of the rim is ·35-·4 ins., of the shoulder ·45 ins. The rim is thickened and apparently slightly rolled. The shoulder varies from a slight thickening to a marked ledge. The sherds of this pot were found mainly in the hearth-layer on till in front of the portal; a few came from among the stones of the cairn-sealing, having been perhaps thrown up at some period of disturbance.

C consists of four fragments of a coarse pot from the cairn-sealing (inv.nos. 102, 106). The surface is uneven and unpolished, soft and reddish on the outside, harder and greyish on the inside. The biscuit is black and flaky. From its curve the pot must have been about a foot in diameter. No rim was recovered, but only a coarse ridge-shaped lug 2 ins. long, which projects ·8 ins. from the surface of the pot. Horizontal lugs are fairly common in Scottish neolithic pottery, though have so far been seldom discovered in Ireland; and a lug as large as this one may be considered as a freak.

D consists of many fragments[17] of a coarse undecorated pot, probably medieval, from the disturbed area beneath the western hornstones. The outer surface is black, the inner grey; it is uneven and unpolished, but rather hard and gritty. The biscuit is gritty, the thickness ·22-·3 ins. The pot was apparently of globular shape, with incurving neck and splaying rim; one sherd might be part of a flat base.

Whereas the neolithic sherds B and C are probably contemporary with the construction of the monument, it is more difficult to decide whether A and D belong to the same period, or whether there were two disturbances. The shape of A1 reminds one of iron-age fabrics of the souterrain-class; their lower limit cannot be precisely fixed, but developments of them were found at Doonmore, assigned to the early thirteenth century[18]. D is medieval in type, and pots of this shape were common in the crannogs and were probably used until the end of the sixteenth century. No evidence has yet been brought to light that would disprove the ascription of both these pots to the tenth or eleventh century, a date which would concord with that of the blue glass bead discussed above[19].

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(15) Inv.nos. 13, 37, 45, 47, 80.
(16) Inv.nos. 91, 94, 100, 106, 109.
(17) Inv.nos. 73, 74A, 75, 76, 81, 82, 84, 85.
(18) Childe, *Ulster Journal of Archaeology* III i (1938), p. 122.
(19) See above p. 22.

EXCAVATIONS AT SALLAGH FORT.

By O. Davies.

The fort of Sallagh lies on the land of Mr. William Robinson, on a low hill standing apart from the Braes[1]. Its situation would not attract notice, except for a small thorn-bush visible from several hundred yards away. Miss M. Gaffikin was informed of the discovery of the souterrain, and with the kind permission of the owner, she determined to open it up, to see if it was a megalithic chamber. Funds were granted for this work by the Archaeological Section. The clearance of the mud-filling of the souterrain demonstrated its real nature; but a drain revealed unexpected evidence about its construction, and it was decided to dig trial-trenches to test the history of the fort. This work was carried out on various occasions between 1934 and 1938, with the help of Miss Gaffikin, Mr. I. J. Herring and Mr. H. O. Belfour. Though a complete excavation of the fort might, in view of its interest, have been advisable, I can claim that its history and structure are now fairly certain, and that sufficient finds have been made in the various layers to obtain a sequence.

The first occupation is represented by a dark unctious layer containing fragments of burnt bone and a good deal of charcoal[2], which appears on all sections[3], and extends beneath the revetting wall of the fort. It seems to have been a turf-layer and a structureless[4] area of settlement, whose limits have not been determined, save that it peters out near the wall on the west. In it were a great many flint-flakes, both within[5] and outside[6] the area of the later fort. Rather more characteristic are rough hollow scrapers, a type represented by examples at various levels[7]. The only pottery which could be assigned to this layer was two small sherds (inv.no.43), ·45 ins. thick, sooted on one side and dark on the other; they have no characteristic shape, but in fabric clearly belong to the " souterrain "-class.

Mr. Robinson told me that in ploughing he had found a thick hearth-layer a short way east of the fort. We hoped to discover this by continuing the SE trench, but were unsuccessful. This must however belong to the first occupation-area. Farther off, two fields east of the fort, was unearthed a hoard of polished stone axes; but these need not be connected with the iron-age occupation of the district.

The second occupation consists of a layer of dark or black clay of varying thickness, usually directly overlying the first occupation, and often not easily

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(1) O.S. Antrim 35, 9·2″ east, 8·4″ south, altitude 600 ft.

(2) All charcoal from this site was most kindly examined by Mr. M. Y. Orr, of Royal Botanic Gardens, Edinburgh. This layer contained inv.no.3 willow from outside wall, 20 and 51 hazel, 50 willow, 81 willow and ash.

(3) NW S SE W WE. Soil specimens 80 81 82 90.

(4) Apart from two pits in SE trench, which may be post-holes.

(5) Inv.nos. 5 20 42 44 50 51, 11 flakes, 2 burnt flints.

(6) On n.w. inv.no.3, 6 flakes ; on s. and e. inv.nos. 40 71 75 76, 18 flakes, 1 burnt flint.

(7) Fig. 3, inv.nos.42 with one hollow, and 3 with much cortex and several hollows on two sides. Inv-no.40, with three small shallow hollows.

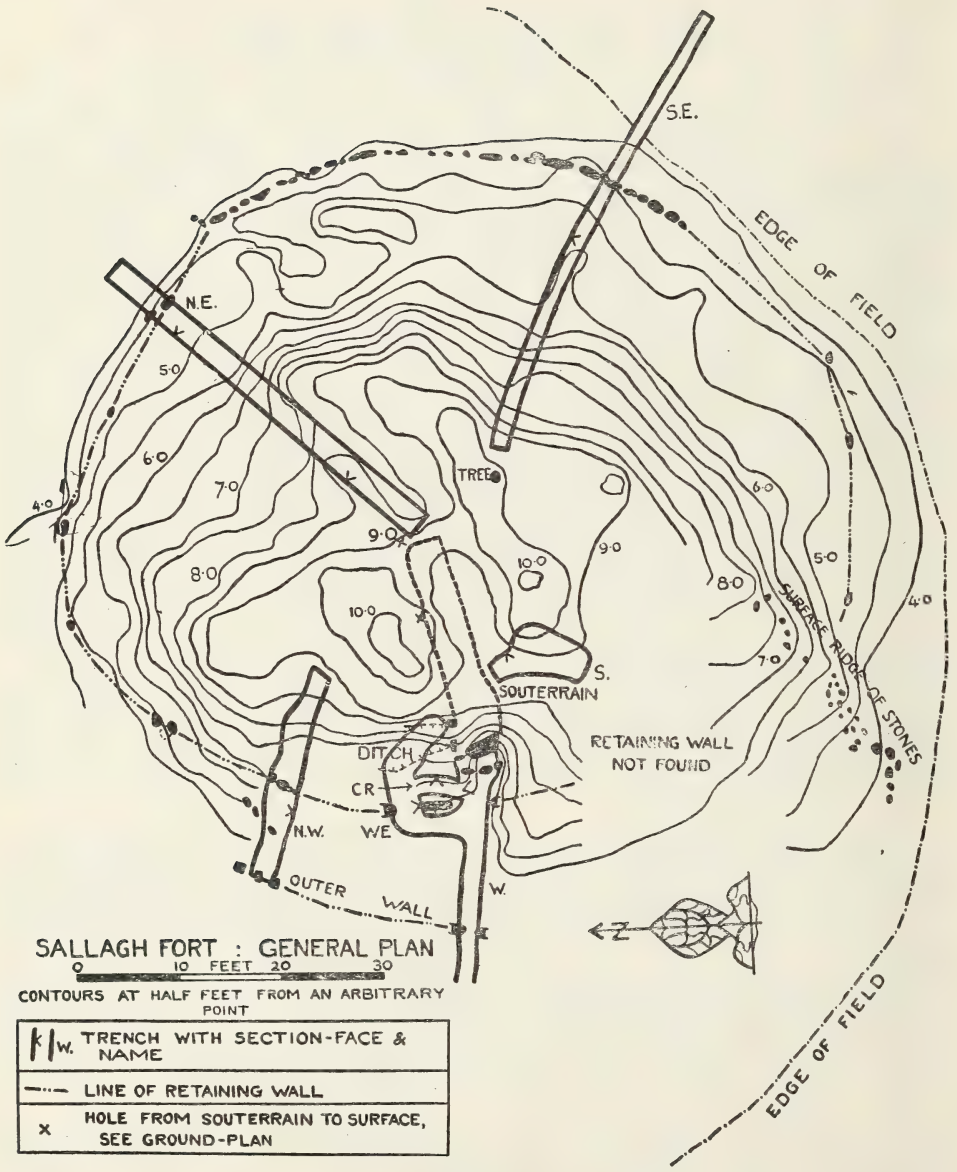
S.E.
EDGE OF FIELD
N.E.
5·0
6·0
7·0
4·0
TREE
9·0
8·0
10·0
6·0
5·0
4·0
SURFACE RIDGE OF STONES
S.
SOUTERRAIN
RETAINING WALL
NOT FOUND
DITCH
CR
N.W.
W.E
W.
OUTER WALL
EDGE OF FIELD
SALLAGH FORT : GENERAL PLAN
0 10 FEET 20 30
CONTOURS AT HALF FEET FROM AN ARBITRARY POINT
W. TRENCH WITH SECTION-FACE & NAME
LINE OF RETAINING WALL
HOLE FROM SOUTERRAIN TO SURFACE, SEE GROUND-PLAN

Fig. 1.

distinguishable from it[8]. It contains willow and pine charcoal (inv.no.220). To this period we must ascribe the circular revetment-wall of the fort, found in all trenches, and tested by a series of small pits, as marked on the plan[9]. It consists of slabs set on edge, a foot or two high. A long stretch was opened on the east side, where the stones are fairly low, but from the amount of fallen material had probably been built up in several courses. In NW and W trenches, perhaps owing to the slope, there seem to have been two revetting walls, each so wide that it had an innner and an outer face; this was not observed on any other side. The second habitation-layer abuts against the wall-stones, and in general rises to the level of their tops.

Sherds and flints found near the edge of the monument, where the second layer outcrops, the banked clay of the third occupying a much smaller area than that enclosed by the revetting wall, probably belong to the second layer, but may be casual subsequent droppings. Of the flints there are eighteen flakes, one flake chipped into a small hollow on one side (inv.no.6), and another roughly serrated along a straight edge (inv.no.53). There were several coarse sherds of " souterrain "-class, hard and unpolished, reddish and sometimes sooted; some are ·35 ins. thick (inv.nos. 73, 74), one only ·17 ins. (inv.no.2). Only one rim was found (inv.no.6, fig. 4), with a marked groove along the top, which seems to have been formed by a coarse cord-impression.

The souterrain (see plan and cross-sections, fig. 3, also trench W, fig. 2) is built of fairly well-laid boulders, with chosen squared stones for the entrance and roofing-slabs. The latter average 4 by 2 ft., and the walls are corbelled slightly inwards. Through two chinks there is communication with the surface. The height is just under 6 ft. The souterrain has a single chamber, and lacks the narrow doors which characterise this type of structure. It was discovered by breaking the western end-wall, but the original entrance was by a low door on the north, the lintel of which is level with the surface of the till (see W trench). The door was approached by a sloping ditch with lip lined with small slabs (WE trench), which had later become filled with clay containing deposits of blue material which Dr. Common has identified as vivianite, derived probably from decomposing bones (inv.no.91). Yet, though the souterrain had been partially sunk into till (cp. W section), it is clear that it was constructed half above ground, the stone roof being covered and counterweighted by about a foot of yellow and grey clay, probably old turf-blocks, as shewn by thin black lines in the yellow in NE trench, and perhaps revetted with posts (see S trench). It was built earlier than, but perhaps planned contemporaneously with the raising of the fort for the third occupation. In South Down are a few souterrains not entirely sunk below ground, which could however be explained by the rockiness of the subsoil. At Sallagh however this explanation is not feasible, and the simplicity of the structure suggests an early date. I would surmise that souterrains are derived from the megalithic chamber, built by men who no longer understood how to move large stones, but who reoccupied megaliths, as we know happened not

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(8) Soil specimens 88 from CR, 89 from W, WE S, not clearly distinguishable in NW, 83-85 SE, where the layer is thick and seems to shew a long occupation, with whitish streaks, perhaps of ash, and a layer partly red and partly black, and perhaps a thin layer of gravel (86), which may however be part of the foundation for occupation 3. NE, the lowest grey layer reached.

(9) Only on the south-west did tests fail to reveal it, perhaps owing to disturbance, and a more thorough exploration would probably have fixed its line also on this side.

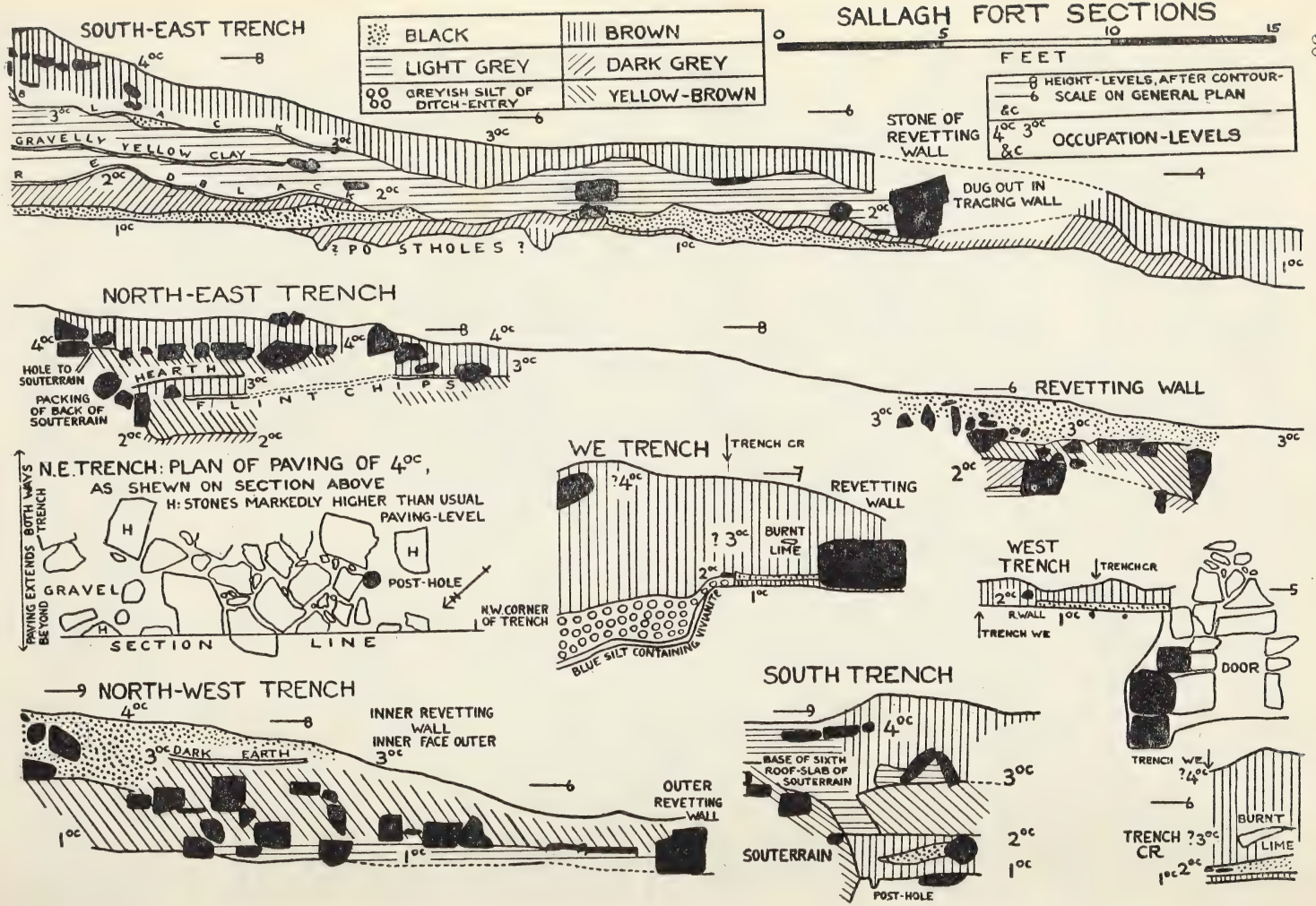
SALLAGH FORT SECTIONS
FEET
BLACK
BROWN
LIGHT GREY
DARK GREY
GREYISH SILT OF DITCH-ENTRY
YELLOW-BROWN
HEIGHT-LEVELS, AFTER CONTOUR-SCALE ON GENERAL PLAN
OCCUPATION-LEVELS
SOUTH-EAST TRENCH
GRAVELLY YELLOW CLAY
BLACK EARTH
? POSTHOLES ?
STONE OF REVETTING WALL
DUG OUT IN TRACING WALL
NORTH-EAST TRENCH
HOLE TO SOUTERRAIN
PACKING OF BACK OF SOUTERRAIN
HEARTH
FLINT CHIPS
REVETTING WALL
N.E. TRENCH: PLAN OF PAVING OF 4OC, AS SHEWN ON SECTION ABOVE
H: STONES MARKEDLY HIGHER THAN USUAL PAVING-LEVEL
PAVING EXTENDS BOTH WAYS BEYOND TRENCH
GRAVEL
POST-HOLE
N.W. CORNER OF TRENCH
SECTION LINE
WE TRENCH
TRENCH CR
REVETTING WALL
BURNT LIME
BLUE SILT CONTAINING INVENTRY
WEST TRENCH
TRENCH CR
R. WALL
TRENCH WE
DOOR
NORTH-WEST TRENCH
INNER REVETTING WALL
INNER FACE OUTER
DARK EARTH
OUTER REVETTING WALL
SOUTH TRENCH
BASE OF SIXTH ROOF-SLAB OF SOUTERRAIN
SOUTERRAIN
POST-HOLE
TRENCH CR
BURNT LIME

Fig 2.

infrequently in the iron-age. Later, with growing insecurity, the idea of concealment developed, and several chambers were built, communicating by narrow doors. The underground souterrain and its counterpart in Cornwall can hardly have begun to be constructed later than the fourth or fifth century A.D., in which case the Sallagh souterrain and the first two occupations must belong to that obscure period contemporary with the Roman occupation of Britain. The Goward excavations shewed that the reoccupation of megaliths began in Hallstatt times; and there is no difficulty in supposing that the Irish were using " souterrain "-pottery all through the Roman era, as its prototype has been found in a late bronze-age context at Loughash (Tyrone).

The walls of the souterrain rest on till; but it was apparently floored with a thin layer of soft red sand, becoming grayer in the inner part of the chamber. On the floor was no hearth-layer or other signs of occupation. The souterrain was entirely filled with liquid grey mud. Near the base of this was a hone eight inches long (inv.no.55), at a higher level a piece of coarse dark pottery with roughly flattened rim (inv.no.54, fig. 4). Neither of these finds can be regarded as contemporary with the structure, but they probably fell in along with the mud-filling.

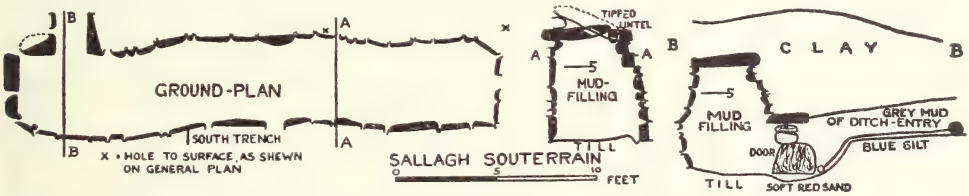

Fig. 3

The souterrain seems to have remained open during the third occupation, as the clay covering the ditch-entrance probably belongs to the fourth. It must, however, have been deserted for an interval before being sealed, as the ditch had been silted up to about six inches from the top. In the clay-covering was found, over a rather circumscribed area partially defined by a row of small stones, a layer of burnt lime two inches thick with red burnt earth below. It extends above the revetting wall, than which it was later, and deposited when that wall was no longer in use. Dr. Common, who has examined the specimens, reports that both red and white earth contain an unusual amount of phosphate, suggesting derivation from burnt bones or other animal-refuse. The layer is not however sufficiently continuous for it to be assumed to be the surface of the third occupation, though if it was, its position in trench CR would not invalidate the suggestion that that occupation is contemporary with the use of the souterrain.

The third occupation consists in NE trench of a brown layer, resting on a bed of flint-chips with a few artificial flakes and a little hearth-material overlying nearly a foot of yellow-brown clay. A similar stratification was observed in other parts of the monument[10]. In the clay were found five artificial flint-flakes and seven sherds of " souterrain "-pottery, ·3-·5 ins. thick, coarse and hard, one of them a much-splaying base[11], also a little burnt bone and some fragments of elm and ash charcoal (inv.no.203).

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(10) Sections S, SE a thin black layer inv.no.87 over grey clay, NW where the somewhat fragmentary layer overlies part of the revetting wall.

(11) Inv.no.204, fig. 4 ; also 160-162 200-208.

Occupation III was the most prolific layer of the fort. It yielded a small stone probably used as a hammer (inv.no.31), fifteen flint-flakes, a rough flake slightly retouched on one edge (inv.no.7), a large flake, 1·9 x 1·6 x ·38 ins., with cortex on one side, roughly chipped to a flat L-shaped scraper (inv.no.30, fig. 4), and a large chip of flint, 4·3 x 2·2 x ·8 ins. average thickness, steeply flaked on one side as a scraper (inv.no.4, fig. 4). There was also ash hazel and willow charcoal. A good deal of coarse pottery, ·15-·5 ins. thick, was found. It is nearly all reddish-brown and often heavily sooted, but it is difficult to sort out the several pots, because only trial-trenches were dug and so little was recovered of each pot. There are many fragments of inv.no.30, with reddish surface and biscuit, and no soot, including a rim decorated with deep radial stabs (fig. 4). Another rim (fig. 4), much sooted on the outside and with grey biscuit, is similarly ornamented; its thickness diminishes in the upper part of the body. A third (fig. 4) is ·35-·5 ins. thick, with grey biscuit and reddish surface, somewhat sooted on the lower part of the outside; the rim is rounded, the walls apparently vertical, the pot large; on the surface is a low horizontal lug, ·6 ins. wide and ·2 ins. high, partly broken so that its length is uncertain. Of inv.no.7 are many pieces of a large pot with vertical walls, rounded rim and apparently flat base; on one piece, 1·2 ins. below the rim, is a hole ·2 ins. across, biconical and without rough marks of boring. The sherds are much sooted on the outside and grey on the inside, the biscuit is black. One piece of inv.no.7 (fig. 4) has a

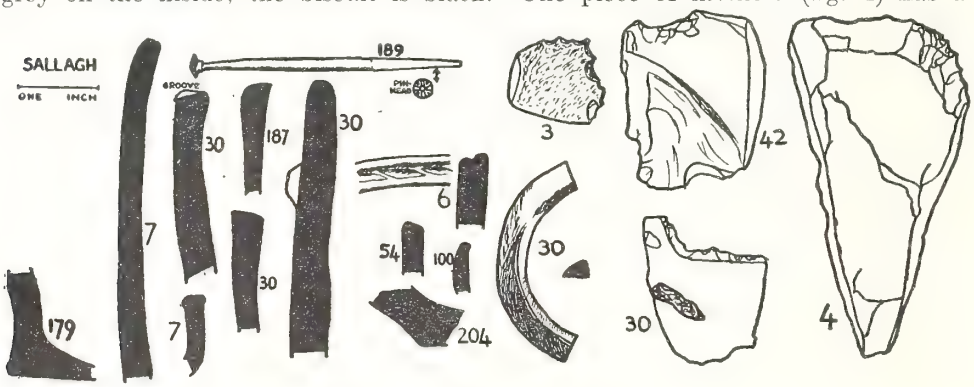

Fig. 4.

flattened and slightly rolled rim ·2 ins. thick, reddish-grey on outside and dark on inside; it seems to be the neck of a globular jar, the only one identified from Sallagh. Other sherds (inv.nos. 184 187, fig. 4) have a hard dark surface and grey biscuit, ·25 ins. thick, with pointed rim inclined slightly inwards. There is also a flat base with vertical walls of cooking-pot type (inv.no.179, fig. 4), which could belong to any of the above pots. But the most important find in this layer is a bronze pin (inv.no.189, fig. 4) 3·4 ins. long. The shaft bulges slightly in the centre, where it is ·13 ins. in diameter, at the neck only ·9 ins. The lowest inch is of square section. The point is blunt, the head is decorated by radial grooves and looks worn by use. The pin is of a type common in the early Christian period, and affords a better criterion for dating the occupation-layer than the pottery, which continued unchanged for perhaps a thousand years.

Above the third occupation was a layer of brown, grey or yellow clay (NE SE S CR WE trenches), containing one bone fragment (inv.no.134), hazel ash and birch charcoal (inv.nos. 140 142), six flint-flakes, one roughly retouched to a serrated edge with small hollows and points (inv.no.130), another formed into a

scraper (inv.no. 132), and a coarse sherd ·4 ins. thick, sooted on the outside but without shape. On part of the clay is a paving of large basalt-blocks set flat-face upwards and packed in with one or two layers of smaller stones (NE SE S trenches). This paving is not continuous, but the yellow surface-clay or gravel which replaces it abuts against it and must be contemporary. Apparently, however, the pavement was not the first phase of the highest occupation, as in NE trench was found a dark patch with charcoal in the yellow clay, to 1 ft. 7 ins. deep, probably a post-hole but underlying one of the paving-stones.

The area of the top layer is more constricted than that of the others, and on the east the third comes to the surface not far from the wall of the souterrain. The top paving thus belongs to a small fort, which must be regarded as of the nature of and built on the same principles as a mote. I doubt, however, whether it is as late as the Norman period. It is much smaller and lower than any Norman mote, and the interval between the third and fourth occupations was not sufficient to allow the ditch-entrance of the souterrain to silt up entirely. I have given reasons for not dating the third occupation too late in the first millennium A.D., and I would be loth to postulate an interval of 700 years before the construction of the top pavement. Childe[12] believes that the idea of defence from an eminence is typically and exclusively Norman, and was not adopted by the Irish before the Norman invasion, though it cannot be doubted that imitations of the Norman mote were subseqently constructed in both Ireland and Wales[13]. I think however, that a low small mound may well be pre-Norman. It need not have supported a Norman breteshe, and it did not have a bailey. Indeed, the origin of the mote is exceedingly doubtful; it certainly was not known to the Vikings, and it has been suggested that it is derived from some feature in the Gallo-Roman villa or fortress. We may probably compare the highest occupation at Sallagh with the mound of Clanrolla[14], which has been piled on a thick layer of early iron-age date.

The top layer was not entirely uncontaminated, as I found in it occasional modern sherds; but considering the number of rabbit-holes, stray objects could easily have been carried downwards. In it were ten flint-flakes, three rough scrapers (inv.nos. 100 103 106), many sherds of " souterrain "-type (inv.no.100, probably also 70, ·5 ins. thick, found on the surface), sometimes not more than ·2 ins. thick, and including a thin fine rim (inv.no.100, fig. 4), and hazel charcoal with one fragment of ash (inv.nos. 100 111). It is noteworthy that the find-inventory is entirely pre-Norman; the sherds seemed, as far as they could be identified, to be derived from cooking-pots and not from globular jars decorated with shallow wavy lines; and there was no sign of glazed ware.

A word may be added on the greater variety of charcoal from Sallagh than from sites previously examined. The trees identified were hazel, willow, ash, birch, elm and pine. In neolithic graves oak, hazel and willow are universal, but pine and ash are very rare save in certain districts. In the iron-age the spread into the lower lands had probably brought men into contact with new flora, below the uppermost scrub-levels of the forest; but it is probable also that the trees of the coast-lands were more varied than those of the interior countries, where to-day also the flora is limited.

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(12) *Ulster Journal of Archaeology*, III i (1938), p. 122.
(13) Cp. *Ulster Journal of Archaeology* III i (1938), p. 42 ; *ibid.* III ii (1939), p. 53.
(14) Armagh O.S. 3, plan 15, trace 4.

THE GIANTS' GRAVE.

KILHOYLE, CO. LONDONDERRY.

By I. J. Herring and A. M'L. May.

In 1936 Co. Derry had its first two megalithic excavations, at Carrick East and Well Glass Spring, Largantea. The finds revealed were so unusual that it was decided to pursue investigations in the same area, and the Giant's Grave, Kilhoyle, was chosen, a megalithic grave almost within sight of Carrick East and six miles south of Largantea. The work took place in July, 1937, with the permission of Mr. John Lagan and under the auspices of the Belfast Natural History and Philosophical Society, which has placed the finds in the Belfast Museum. The grant from the Archaeological Section of this Society enabled us to have the services of one workman, and we were assisted also by Mrs. Ivor Herring and Messrs. M. Jackson, V. Everett, D. M'Keenan, and J. Hamill.

The cairn is not on the map, but was chronicled by the first Ordnance Surveyors, from whose notes (O.S. MSS. Royal Irish Academy Library. Box 31.) Borlase discovered its existence (*Dolmens of Ireland.* p. 254. Townland of Kilhoyle, Parish of Balteagh, near King's Fort. Dolmen not on the map. Locally called Giant's Grave.)

The Site.

The map reference is 6″ O.S. Co. Derry, Sheet 17, Plan 15, Trace 2; 12½″ west, 18½″ south.

The chief characteristic of the east side of the Roe Valley is a series of cliff-faces of basalt overlying cretaceous limestone. At Kilhoyle and Dungiven the limestone appears through the scree, and is quarried for agricultural and building purposes. These cliffs extend from Benevenagh to Benbradagh and are cut through by small streams flowing west to join the Roe. The Giant's Grave is above one of these streams, on a bracken-covered platform immediately beneath the southern cliff of Donald's Hill and at a height of 700 feet above sea level. Two hundred yards below it is Mr. Lagan's house, beside the more northerly of the two roads running from Drumsurn to Garvagh. A short distance to the north-west is the magnificent King's Fort crowning a knoll underneath the cliff, and below the road runs a stream which eventually joins the Curly Burn from Largantea to unite with the Roe below Limavady. The situation, indeed, is very similar to that of Well Glass Spring Cairn. Both are beside a stream; both are on the north of a side valley of the Roe, and both look towards the setting sun. Both are miniature megaliths.

Before work started, it was impossible to estimate the type of monument. The small frontal chamber was open and entirely visible, its floor covered by a thin growth of rank grass and rubbish. The rest of the grave was hidden, with the exception of a large flat stone, shown on the plan at the back of the monument. This aroused the hope that the grave was more than a single chambered one.

As the work proceeded, it became probable that we had found a gallery grave of the type common in Tyrone and Derry[1]. There was the upright kerb set close

1. Estyn Evans. *U.J.A.* III, i., p. 13 and fig. 3.

Plate I.

THE GIANT'S GRAVE, KILHOYLE.

1. North and Side Wall.
2. Facade after close of "Dig"
3. Gallery from rear.
4. Paving in Gallery.

to the side walls (this kerb had been ruined on the south side), the small ante-chamber and the long " gallery." The characteristics were all present, notwithstanding the miniature size: the length of the structure is just over 15′ compared with the 25′ approximately of Dunteige, Co. Antrim. When uncovered the monument presented a boat-like effect, with high bows and low stern. This gradual decrease in height from front to rear, 5′ 6″ to 2′, is also to be noted in the double walling of the gallery grave at Labbacalle, Co. Cork[2].

The First Chamber.

This is a small but lofty rectangular chamber, 4′ by 3′ 6″, formed of large upright stones. Stones 1 and 12 (see numbers on the plan) average 5′ in height, stones 2 and 11 just over 4′. Leaning across from 1 to 12 was another pillar stone: the owner of the land assured us that he remembered this in position against the innner face of No. 1, and after Chamber 1 had been thoroughly excavated, we were able, with considerable difficulty and only with the help of three quarrymen, to replace this stone. It is dotted on the plan (13) in its original position. It is 9″ shorter than No. 1. The positioning of the stone, half closing the entrance, gives the facade an odd appearance, and, of course, reduces the size of the chamber to approximately 3′ by 3′ 6″. It is quite possible that the gap between 13 and 12 was originally closed by yet another stone and that the monument was without apparent entrance, as at Labbacalle. Admittedly we could find no depression to suggest another stone, but all parts of the monument were so disturbed that this is not surprising: there was for instance no obvious depression for No. 13 although local opinion was united in placing it against No. 1.

This chamber was closed at the back by a large septal slab, which if the chamber had been covered by a single capstone (that seems probable) would have come to within 6″ of the roof. The slab certainly slopes away at the sides, leaving two spaces between the top of the stone and the side-walls which may be reminiscent of the port-hole entrances, circular or oval gaps through partition-slabs, that are characteristic of the long cists of the Paris basin. In Ireland this port-hole device is usually translated to the edges of the stone, e.g., Burren, Co. Cavan, Deerpark, Co. Clare[3], and, possibly, Labbacalle[4]. We could not detect hammering on the Kilhoyle stone, but a slab with natural cut-away sides may have been deliberately chosen. With a flat roof, the greatest size of the apertures would have been 2′ by 1′, a possible if extremely awkward entrance when we take into account the smaller stature of the megalith-builders. Nevertheless, whereas some portholes are obviously large enough for the human body, others are little bigger than that at Kilhoyle, e.g. Le Couperon, Jersey[5], and some smaller still. As Kendrick has remarked, " the intention of the builders in the various areas when they fashioned the port-hole may not have been everywhere the same "[6], e.g., for depositing offerings, or a soul-passage, or an actual entrance.

However we do not intend to press the reminiscence of the port-hole, except to point out that the two apertures, from the evidence discovered, represent the only means of access to the " gallery."

This first chamber provided interesting finds but unfortunately without stratification, the disturbance here being only less than in the chaos of the front

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2. Leask and Price, *P.R.I.A.* XLIII, Sect. C, p. 79.
3. Borlase, *Dolmens of Ireland.* p. 205 and 70.
4. Leask and Price, *Op. cit.* Fig. 4.
5. Kendrick, *The Axe Age*, fig. 4.
6. *Op.cit.*, p. 40.

part of the gallery. Underneath the rank covering of grass appeared a bed of ash and charcoal with pieces of modern crockery. We imagined that the crocks had been deposited overnight by children who had been told that we were looking for old pots, but the real explanation was soon forthcoming. This chamber had been used as an Easter House. It is the custom at Eastertide for the children to select a "house," usually a limekiln in these parts, in which to light fires and boil eggs. This accounted for the layer of ash and also for the great quantity of eggshells discovered. Immediately under this came the yellowish-brown earth of the locality, which also fills the interior of the grave. This contained many scattered sherds of pottery, fragments of cremated human bone (see Professor Walmsley's report) and flints (e.g., a hollow scraper F.2. and a microlithic leaf-shaped blade F.10). Some sherds of Pots 1, 3, 5, 7, 8 and all which were found of Pots 6 and 9 came from this chamber. The sherds were very mixed, and the least scattered were the fragments of the beautiful Food Vessel, Pot 6, which were in the disturbed till forming the prepared floor of the monument (nevertheless two sherds of this pot came from the bank of cairn just outside the chamber and above the level of grass in the chamber as we found it).

At the same depth as the majority of the sherds of this pot, i.e., in disturbed till, and at the north corner of the chamber, were found packed stones suggestive of the remains of a cobbled floor. Further examination however showed that they were packing stones for upright 2. Both this stone and its opposite number, 11, were leaning inwards slightly: the local stone sometimes splits this way (see stone 8).

The most interesting find in this chamber was the attractive barbed and tanged arrowhead (F. 8.) found underneath the septal slab. Taking the septal slab as an original feature, as we must, this location suggests a late date for the monument. On the other hand, as the septal slab has rather a pointed base and the arrowhead was not directly under the point, the arrowhead could possibly have worked to this position during disturbance of the first chamber.

After we had cleared out this chamber down to the firm yellow till and replaced stone 13, we filled the chamber with an 18″ layer of stones to stabilise the structure.

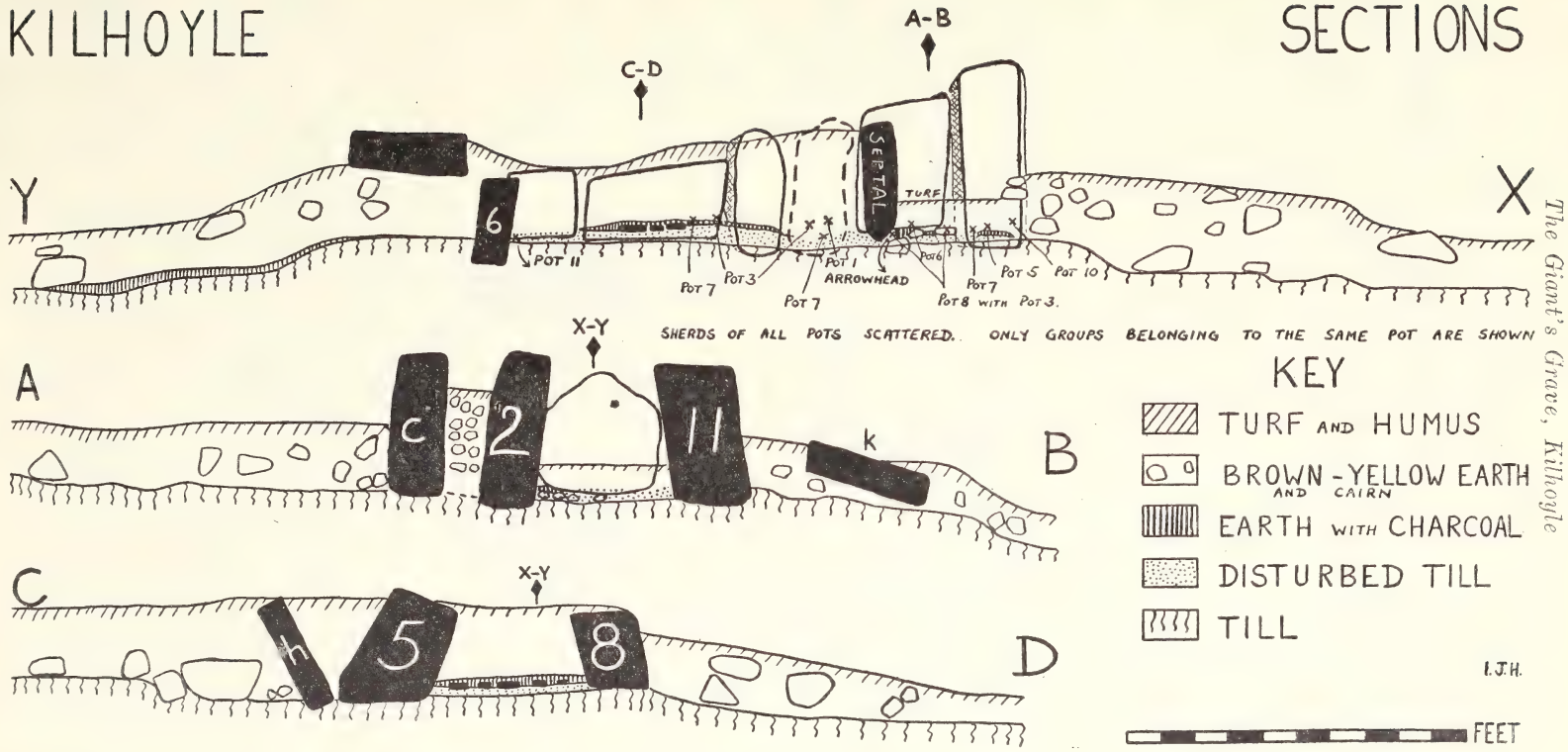
The Gallery.

This is 9′ 9″ long, with an average width of 4′ 6″. Its contents were so chaotic that we have thought it unwise to complicate the appearance of our Long Section drawing by inserting the details of the upper levels. The forepart of this chamber, i.e., the area bounded by the stones 3, 4, 9, 10, was the most disturbed part, with the remains of side walls, earth and rubbish lying loose, so loose that there were empty spaces at depths of 2′ 6″ below the top of the septal slab. Moreover, on the floor were modern metal, crockery and more eggshells.

At first we believed this gallery to have consisted originally of two chambers divided at the nearer end of stones 5 and 8. The arguments in favour of this were:—

(a) The forepart of the gallery had side walls of pillars contrasting with long low blocks 5 and 8 resting on their sides at the rear.
(b) The rear had the remains of paving which was absent from the forepart.
(c) There appeared to be a crude dividing wall consisting of a platform of firm yellow earth, then stones, and, on top, a flat slab.

Later this opinion appeared untenable in view of the fact that the slab of this " wall " was seen to make a pair with Stone 9 and had obviously been part of the north side wall (4). The builders would scarcely, with the material at hand,


KILHOYLE
SECTIONS
A-B
C-D
X-Y
Y
X
A
B
C
D
SEPTAL
TURF
6
POT 11
POT 7
POT 3
POT 7
POT 1
ARROWHEAD
POT 6
POT 7
POT 8 WITH POT 3.
POT 5
POT 10
SHERDS OF ALL POTS SCATTERED. ONLY GROUPS BELONGING TO THE SAME POT ARE SHOWN
c
2
11
k
4
5
8
KEY
TURF AND HUMUS
BROWN-YELLOW EARTH AND CAIRN
EARTH WITH CHARCOAL
DISTURBED TILL
TILL
I.J.H.
FEET

have started a " wall " with a raised platform of earth, and this must be due to the weight of the recumbent slab which gave to the earth underneath it a firmness contrasting with the loose filling around. A further objection to a subdivision of the gallery is that we found the layer of charcoal from the paved part of the gallery to extend under this platform of earth and a foot beyond the dividing " wall." In addition, the contrast of the paving cannot be taken as a proof, as that paving had disappeared from a considerable part of the rear, and its fragmentary survival was obviously fortuitous. In the loose filling of the fore-gallery there were flat stones which could have belonged to a paving. As for the contrast in walling, it may be suggested that the megalith-builders, with the deliberate object of sloping the monument from front to rear, selected the finely-shaped slabs 5 and 8 to give a solid wall of the right height for the " stern " of the grave. The final consideration is that any division of the gallery would be more likely to show a depression in the floor than a platform of earth overlaid by stones.

We were able to complete the walling of the gallery. Upright 10 was found displaced and leaning across its original position. Upright 3, of similar height, 3′ 9″, was lying against the septal slab. These we have replaced in their conjectural positions as indicated by an examination of the floor. The slope of the gallery can thus be given: stones 3 and 10, an average height of 3′ 9″, stones 4 and 9, an average of 3′ 6″, stones 5 and 8, average of 2′ 8″ sloping down to 2′.

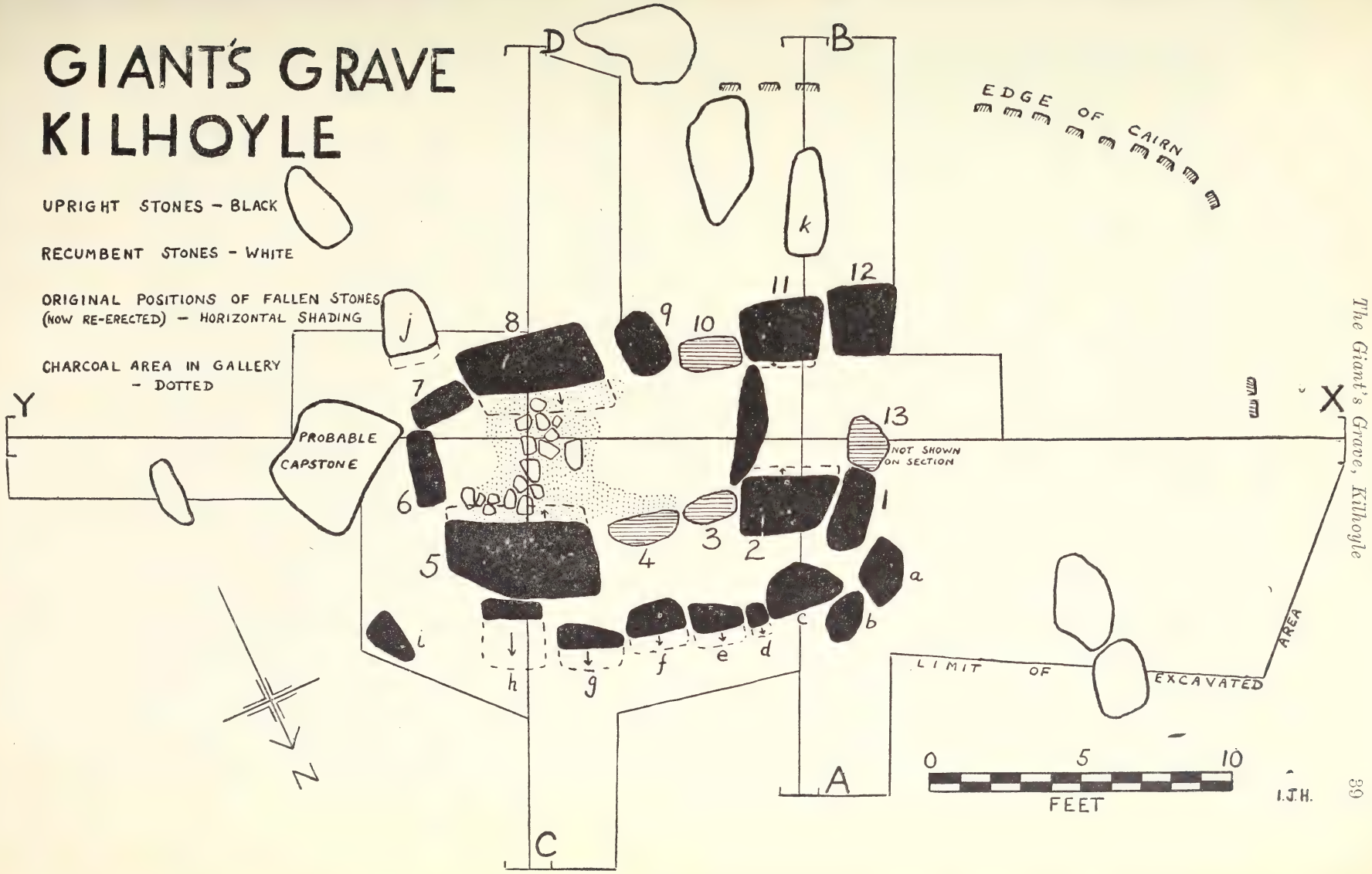
The end stone 6, 2′ 10″ in height and 1′ 1″ thick, was the only upright in the monument sunk into the till, to a depth of 7″. It may be suggested that the placing of this stone was the first step of the builders, as a limit mark, followed by a preparation of the area designed for the grave with a clean bed of dug till. The alternative is that the stone was sunk to bring it down to the average elevation of its neighbouring wall stones.

Both stones 5 and 8 (2′ 3″ and 1′ 10″ thick respectively) slope inwards, but 8, at least, is resting on a horizontal base. The chamber between them thus narrows from 4′ 6″ at the floor to 3′ 3″ at the top of the stones. The flat stone lying behind the end stone 6 is doubtless a displaced roof stone for this end of the gallery. It measures 3′ by 4′ and is 1′ 2″ thick.

Stone 5 is interesting for the presence of possible cupmarks, one on the top of the stone near the middle of the inner edge is $2\frac{1}{2}$″ in diameter and $\frac{3}{4}$″ deep. The inner sloping face has two more, both $1\frac{1}{4}$″ diameter and $\frac{1}{4}$″ deep.

We have mentioned the remains of a paving in this part of the gallery. It consists of flat slabs of varying size but averaging 9″ across, set upon a bed of disturbed till which, in this part is 4″ to 5″ deep. The extent of the paving, as we found it, can be seen on the plan. It was covered by a thin layer of charcoal containing scraps of cremated bone. The charcoal also spread in a layer in the area contiguous to the paving. This is marked on the plan. It was nowhere more than 2″ thick. In places it was found underneath the level of the paving, but this is due to penetration between the paving stones. Isolated scraps of charcoal also appeared through the filling of the gallery. The charcoal has been kindly identified by Mr. M. Y. Orr, of the Royal Botanic Gardens, Edinburgh, as Willow from the cairn in front of the facade; Oak and Hazel in equal amounts from the first chamber, and from the gallery Oak and Hazel, one fragment of Birch and a piece of Gorse. The charcoal under the level of the paving was Hazel only.

The flints from the gallery were undistinguished. As has been explained, most of the pottery was very scattered. In the forepart of the gallery most of the sherds came from a depth more than 2′ 6″ below the top of the septal slab: in the rear the highest sherds came from a level 6″ below the top of the side walls, the lowest from crevices between the paving.


GIANT'S GRAVE
KILHOYLE
UPRIGHT STONES – BLACK
RECUMBENT STONES – WHITE
ORIGINAL POSITIONS OF FALLEN STONES (NOW RE-ERECTED) – HORIZONTAL SHADING
CHARCOAL AREA IN GALLERY – DOTTED
EDGE OF CAIRN
PROBABLE CAPSTONE
NOT SHOWN ON SECTION
LIMIT OF EXCAVATED AREA
A
B
C
D
X
Y
N
0 5 10
FEET
I.J.H.

In the forepart came P 2, represented by one sherd, and Pot 4, together with fragments of Pots 3 and 8 which had also appeared in Chamber I. Sherds of Pots 1 and 7 came from both parts of the gallery. Those referred to as being in the interstices of the paving belonged to Pot 7. The one pot in a definitely localised position was the crude vessel 11, from the extreme N.E. corner.

The roofing of the rest of the gallery and Chamber I is conjectural. It was probably of single slabs, easily obtainable for a span of 4′ to 4′ 6″. In discussing the absence of an entrance to the gallery other than that provided by the shape of the septal slab, we should bear in mind the conclusions arrived at by the excavators of Labbacalle, a gallery grave with no apparent entrance. They decided that the last roofstone placed in position by the builders was so easily slid aside (they themselves found it necessary to do this) that it might represent the means of access.[7] It is also possible that either the builders of our Kilhoyle Giant's Grave did not envisage later interments, or that they were more preoccupied with the prehistoric fear of the spirits of the dead and with the necessity of keeping them well shut in, than with the task of providing easy access for later burials.

The Kerbing.

Roughly parallel to the north wall of the monument and very close to it was a row of standing stones, lettered a to i on the plan. They are smaller than the walls of the monument. Their heights are:—

a ... 4′	e ... 3′ 2″	i ... 1′ 10″
b ... 3′	f ... 3′ 7″	
c ... 3′ 7″	g ... 3′	
d ... 2′ 4″	h ... 3′ 4″	

d to i lean outwards. c is shown on the Cross Section A-B: h is shown leaning from its socket at the back of stone 5 on the Cross Section C-D. They are all sunk slightly into the till and wedged on the outside by small stones. An examination of the space between the side wall of Chamber I and kerb-stone c showed that the intervening space of 1′ was filled by packing stones and earth.

On the south of the monument the kerbing had gone, but it is suggested that the two flat stones j and k represent the remains of this kerbing. The till underneath them showed a depression. The other flat stones found loose on top of the turf might have been more kerb stones.

It may be that the term kerbing given to this feature of this type of grave is inaccurate. It is very close to the side walls even as a kerb for a low cairn piled on the grave. At Labbacalle the excavators found a double row of standing stones outside each side wall, and at 9′ to 20′ beyond the outer row a definite kerb of small stones.[8] The twin rows close to each inner wall at Labbacalle are therefore merely reinforcements such as were found at Well Glass, Largantea. It must be noted however that the second " wall " at Largantea backed against rather slender slabs, and this applied also at Labbacalle where the limestone was split into slabs 10″ to 1′ 4″ thick. This need for backing slender uprights did not exist at Kilhoyle where solid slabs were obtainable, but the practice may have been translated in our area from a necessity to an architectural custom.

A further suggestion may be made as to the function of this outer row other than as a kerb. If access to the gallery had to be made by sliding aside a roof stone, then a second wall close to the inner wall would be an obvious architectural improvement as providing a support for a temporarily displaced roof stone.

But a solution of these problems of " kerb " and roof must wait for further evidence from work on monuments of this class in Northern Ireland.

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7. Leask and Price, *Op. cit.*, p. 81.
8. *Op. cit.*, Plate XII.

THE CAIRN.

There was little evidence of the shape of the enclosing cairn except in the sector south and west of the first chamber where the edge of the cairn could be traced as the fringe of a low mound of earth and stones crowned by the first chamber. On the Cross Section A-B the cairn edge is shown at 7′ from the outside of stone 11, and on the Long Section at 12′ from the facade. Its curves between those two points suggest an oval or rectangular cairn, comparatively narrow for its length.

One half of the very low mound in front of the facade was cleared down to the till. It revealed nothing except closely packed cairn stones in a small area between " kerb " stone a and the flat stone shown 6′ north-west of it on the plan.

FINDS.

Among the finds were numerous small fragments of human bones. These were scattered fairly evenly through the soil which filled the chambers and were usually associated with small pieces of charcoal.

Professor T. Walmsley kindly examined the bone fragments, and extracts from his report are subjoined. It was evident from the condition of the chambers that considerable disturbance had taken place at some time, and this was borne out by the evidence from the bones and the pottery. Sherds of certain pots were found widely scattered as were also the bones of two of the skeletons.

FIRST CHAMBER.

" A collection of incinerated human bones with some fragments of flint and chalk. The chalk has not been burned."

" The bone fragments are so small and broken that it is impossible to assign most of them to the bones to which they belong, but I was able to recognise parts of most of the bones of the body and to be certain that all these parts are human; among the unrecognised fragments there were none I considered to be animal bones. The fragments I recognised belong to at least two skeletons."

" *Skeleton 1* is that of an adult, of slender build and small size; over thirty years of age but not aged; most probably a female and of indigenous Mediterranean type."

" *Skeleton 2* is that of an adult of heavy, strong, rough build and almost certainly male; no part gives me direct evidence of racial type, but the suggestions are of a short thickset, heavy form rather than of a tall slender form."

" The condition of the fragments of the two skeletons is different; the same difference is present in the unrecognised fragments, so that by their condition alone it is possible to assign all the fragments to the one skeleton or the other. The fragments of Skeleton 1 are in the usual condition of incompletely burnt bones; the firing was not fierce; the incineration was open. The fragments are thus hard, have a metallic ring, and slightly char on heating. The fragments of Skeleton 2 are in a condition I have not seen before; I sent some of them to Mr. A. W. Stelfox, National Museum, Dublin, and he recognised their peculiarity. The fragments are soft, greasy to touch, very easily broken, and extremely chalky, and they can be written with, like chalk, on a paper or blackboard; they are imperfectly, some of them very imperfectly, burnt and they blacken on heating. I am unable to state the cause of the condition, but if the bones of Skeleton 1 and 2 were deposited in the cairn together then the cause must have operated before their deposition; and it may have been (1) a peculiar fatty condition of the body itself, such as occurs in extreme obesity, and of which the heavy rough build of the bones give some suggestion; or (2) a preservation of the body before burning

in some chalky material of which the fragments of chalk found with the bones, if they are not local may be evidence; or (3) a peculiar form of slow low-temperature, imperfect burning which would allow the bones to absorb the body fat."

West Half of Gallery.

" Twenty small fragments of adult human bones; I am not able definitely to recognise any fragments, but most of them resemble the fragments of Skeleton 1 of First Chamber." (These were found at a depth of 2 ft. 9 ins. below top of septal stone beside sherds of Pot 4.)

" Fourteen small fragments of adult human bones, some resemble Skeleton 1 and some Skeleton 2 of First Chamber." (These are from a depth of 2 ft. 4 ins. below top of septal stone.)

" A collection of small fragments of adult human bones of the same general characters and the same two kinds as in First Chamber. I was able to recognise among them a petrous temporal bone which almost certainly formed a pair with a petrous temporal of Skeleton 1 of First Chamber; and I conclude that the fragments of the two skeletons were scattered over First Chamber and West end of Gallery."

East Half of Gallery.

Found above and on pavement. " A collection of small fragments of adult human bones of the same general characters and the same two kinds as in First Chamber. I was able to recognise among them (1) a petrous temporal bone in the same condition as, and almost certainly forming a pair with, a petrous temporal of Skeleton 2 of First Chamber; and (2) part of a further petrous temporal bone—the fifth in the total collection—indicating that the remains of at least a third body are present; the bone is in the ordinary burnt condition and its size and characters indicate that it is probably a female."

Found at Pavement-level in Disturbed Area.

" A collection of small fragments of the same two kinds as in the First Chamber. I recognised among them the supraorbital region of a male skull; it is in the same chalky condition as the fragments of Skeleton 2 of First Chamber, and its characters are those usually associated with a broad skull of heavy build rather than those of a long skull."

Bones from Outside the End-wall of Gallery—Stone 6.

" Six small fragments of adult human bones and flints; the bones do not belong to Skeleton 2 of First Chamber, but I am unable to say whether or not they belong to Skeleton 1 or 3."

Bones from Section at East End of Cairn 4 ft. East of Stone 6 and 1 ft. 9 ins. below Turf Level.

" Eight small fragments of adult human bones; they do not belong to Skeleton 2, but I am unable to say whether or not they belong to Skeleton 1 or 3."

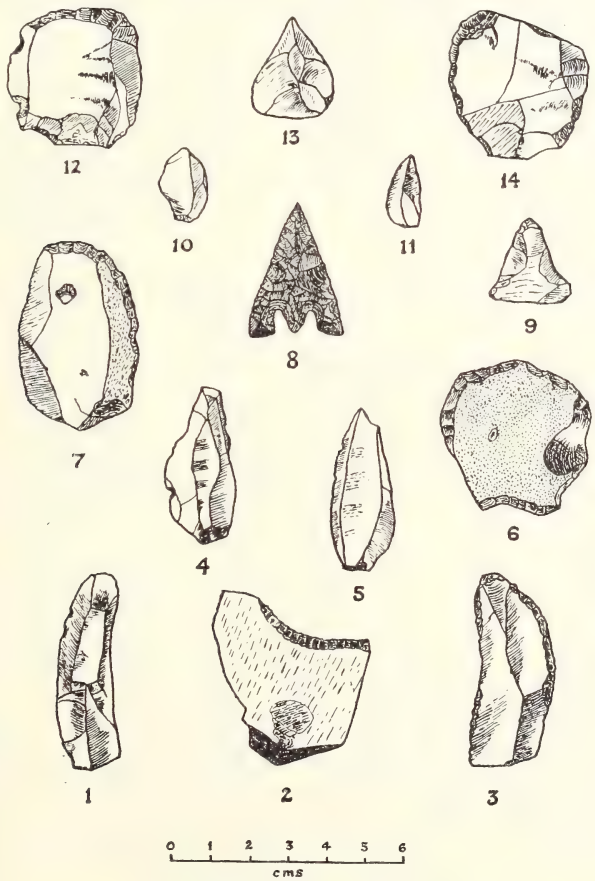
Summary.

" The collection of bones include the remains of at least three persons, two of whom are probably female and one is certainly male. The fragments of the male skeleton are in peculiar condition. The incineration of the bodies was probably done outside the cairn. The indications are that the fragments were scattered over the two chambers, but this may have been a secondary disturbance. The very small size of the fragments indicated, I think, disturbance of some kind."

Flints.

Numerous flints were found, but as this is a chalk district this is not surprising. Twenty-seven were definitely artifacts, and it is quite possible that some not described below were used as tools. Nineteen show considerable retouch. Eleven were made from the semi-transparent flint that was often used for making arrow tips; eight were of a light colour not unlike those associated with sand-hill sites; eight were of a brown or reddish colour, a patination not uncommon in the flints found in the fields here. A short description of 19 of these is given. Of the more interesting ones 14 are illustrated below.

F 1. A white matt-surfaced blade, chisel-pointed, found close to stone 10 in west end of Gallery and 2 ft. 3 ins. below top of septal stone.



Giant's Grave, Kilhoyle—Flints.

Fig. 1.

F 2. In north-east corner of First Chamber, 2 ft. 9 ins. below septal stone, was found a hollow scraper. Scraping facets give a bevelled effect to the edge they were flaked on. Part of bulb removed. Colour reddish brown. At base 2 mms. thick.

F 3. A greyish-brown blade chipped on both edges. Butt square, 6 mms. thick. Found in Gallery near stone 9 and 2 ft. 6 ins. below top of that stone.

F 4. A thin chisel-pointed flake, whitish in colour and serrated by use. Rounded butt, 5 mms. thick. From Gallery below fallen stone 4.

F 5. An almost transparent flake, thin and sharp at point, 5 mms. thick. Found on fallen stone 4.

F 6. Rough outside flake of greyish-brown flint. Chipped almost all the way round the edge to form a scraper, 9 mms. thick. Found on pavement 15 ins. from east end of stone 8 and 9 ins. from its side.

F 7. From north side of cairn outside of First Chamber was found a combined knife-scraper, light brown in colour, 7 mms. thick. A bevelled edge almost completely encircles it. Secondary chipping on edge of upper surface where remains of chalky layer is visible. Natural hole through flint.

F 8. A beautiful arrow tip, symmetrical and very finely chipped, of late Bronze Age type, from under the septal stone. Colour greyish. Five mms. thick.

F 9. Triangular point of fairly transparent flint from Gallery opposite stone 10. Some secondary flaking on upper surface especially on right hand edge. Thickness 2 mms. Found 2 ft. 3 ins. below top of septal stone.

F 10. A microlithic blade of graceful leaf-shaped form. Almost transparent, slightly serrated on one edge as from use. 3 mms. thick. From First Chamber near east corner of stone 12 and 4 ft. below its top.

F 11. Another microlith, lightly amber coloured, 2 mms. thick, pointed leaf form. From First Chamber in front of stone 2 and 3 ft. 9 ins. below top of this stone.

F 12. A round-nosed scraper made from greyish flint. Bevelled on upper face, bulb removed, 6 mms. thick. From south-west corner of Gallery and 2½ ft. below top of septal stone.

F 13. Heart shaped reddish flint point resembling an early type of arrow tip. Some secondary flaking on upper surface, 4 mms. thick. Bulb removed. From south-east corner of First Chamber.

F 14. Under the fallen capstone at rear of Gallery was found a thick scraper, bluish-grey in colour. Secondary chipping on edges. Tip has been broken.

F 15. Basal fragment of a long polished flat flake, light grey, very fine flaking on edges. Base rounded by chipping. Part of bulb removed. Length 44 mms.; thickness 6 mms. Found 15 ins. west of entrance.

F 16. There was found in south-west end of Gallery opposite stone 10 a shield shaped flake, 11 mms. thick at base, mottled bluish-grey colour. Secondary working at butt and edges serrated by use. Length 45 mms. Breadth 38 mms.

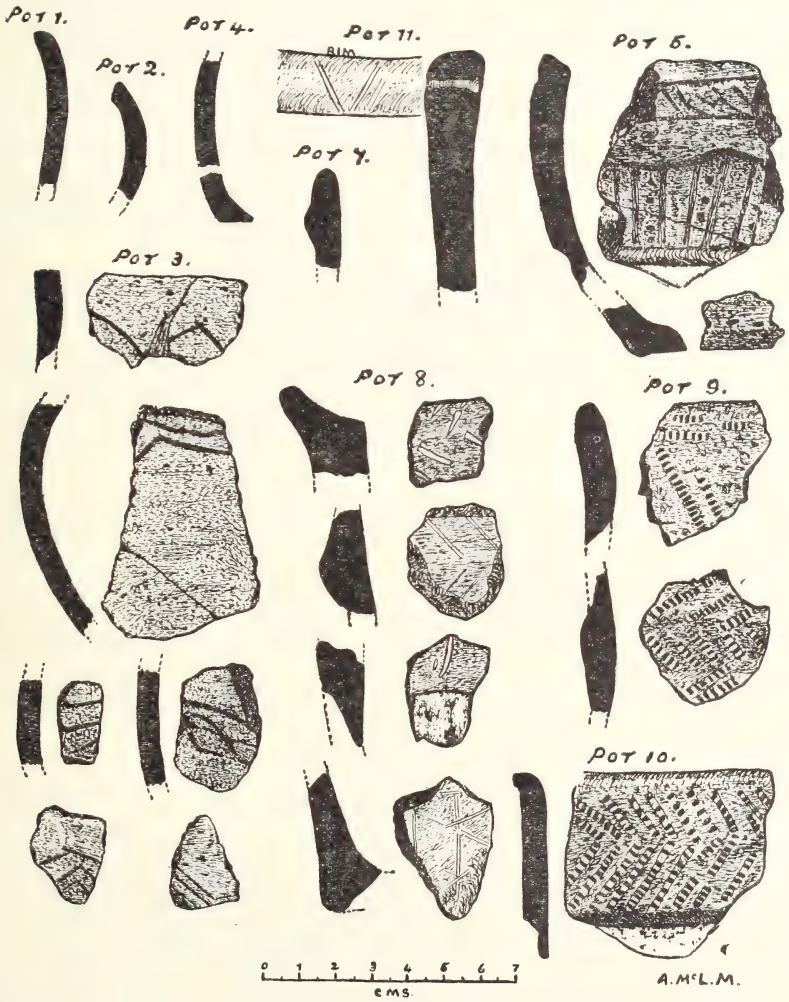
F 17. A semi-transparent knife. 50 mms. long by 23 mms. broad and 5 mms. thick. Serrated by use. Found in east end of Gallery below pavement, 3 ft. west of south corner of stone 6 and 18 ins. from stone 8.

F 18. In First Chamber, 15 ins. from west corner of stone 11 and 2 ft. from septal stone, at a depth of 2 ft. below top of latter stone was found a thin almost transparent knife blade, slightly concave along central facet. Dimensions 38 mms. long, 18 mms. broad and 4 mms. thick.

F 19. An almost transparent narrow leaf-blade with very sharp edges, 39 mms. long, 18 mms. broad by 5 mms. thick. Rounded at base. Found 18 ins. below top of stone 5, 15 ins. from it and 3 ft. 6 ins. west of stone 6.

Pottery.

One hundred and sixty-seven sherds of pottery, the remains of fifteen pots, all broken into rather small pieces, were found scattered at varying depths in the two chambers. Considerable disturbance of the floor was evidenced by the finding of sherds of the same pots in several parts of the structure. Some of the pots proved to be so fragmentary as to make the identification of the period to which they belong one of considerable uncertainty. See Fig. 2 below.



Giant's Grave, Kilhoyle—Pottery.

Fig. 2.

Pot 1 consists of 18 sherds collected from the Gallery and First Chamber, 16 from the former and 2 from the latter. The majority were from a depth of 2 ft. 9 ins. below top of septal stone and near the south-west corner of the Gallery. The surface is hard, smooth, light brown and without decoration. Biscuit showing black layer. Average thickness 6 mms. Neck slightly recurved. Sherds numbered P 1 to P 18 in Belfast Museum.

Pot 2 from west end of Gallery is represented by a single rim sherd, slightly recurved, with outside bevel forming a low moulding. Surface smooth, reddish brown, hard and unoramented, 6 mms. thick. Paste has black layered core. Found close beside septal stone and 2 ft. 3 ins. below its top. Sherd numbered P 19 in Belfast Museum.

As little is known of the pottery sequence of this part of Ulster we cannot ascribe the fragments of Pots 1 and 2 to any particular culture. Professor Childe's comments were: " There is nothing in the sherds sent that absolutely excludes attribution to some phase of the Iron Age (that is still hardly known) or even the local Windmill Hill-Beacharra series. None the less the reddish colour, the surface burnishing (not very good) and what can be seen of the profile are distinctive of (B) Beaker ware. In particular the external bevel at the rim of P2 producing a low moulding recurs in Beaker ware in Scotland (Glenluce, etc.). White grit which I think is generally conspicuous in your ' Neolithic A ' wares as in ours is significantly absent. A recent break in P 2 well shows the layered structure of the core, a feature which is however found also in Windmill Hill wares."

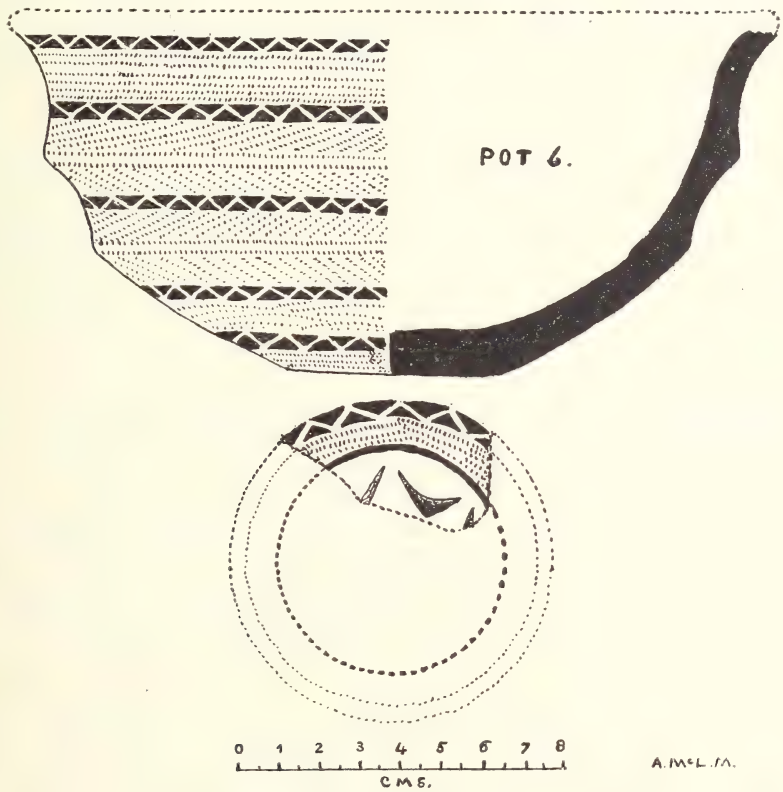
Pot 3 from both First Chamber and Gallery consists of 6 sherds from the former and 18 from the latter. Light chocolate colour outside with very hard dark grey gritty biscuit. Rim flattened, 7 mms. thick, with wide chevron decoration 11 mms. below it. The neck begins to curve out slightly 4 cms. below rim. Seven sherds show triple chevron decoration, but so many pieces are missing that it is difficult to say whether they belong to the upper or lower half of the vessel. Evidently a food vessel of the Bronze Age. Sherds numbered P 20 to P 43 in Belfast Museum.

Pot 4 is from the Gallery, and was found at a depth of 3 ft. below top of septal stone in close association with fragments of bones which Professor Walmsley considers resemble fragments of Skeleton 1. See p. 45. One sherd of base and ten of wall but none of rim, 5 mms. thick. Outer and inner surfaces light brown with black centre showing numerous sand grains; well fired. Perhaps belongs to the same type as Pot 3. Sherds numbered P 44 to P 54 in Belfast Museum.

Pot 5 consists of 15 sherds of a small bowl-shaped food vessel, from the First Chamber, near the entrance, at a depth of 4 ft. 9 ins. below the top of stone 12. Biscuit averages 8 mms. thick; centre black with numerous coarse grits; rough and crumbly; outer surface dark grey, inner light. Rim incurved and bevelled inside. Groove around centre of vessel. Base slightly concave. Three roughly incised rings decorate the neck and between the first and second is a rope design; while below these is an open chevron pattern which surmounts a series of perpendicular lines interspersed with punctured holes, also in lines. These descend to the central groove. A ring of incised holes near base. Probably Bronze Age. Sherds numbered P 55 to P 69 in Belfast Museum.

Pot 6 is part of an elegant food vessel consisting of 8 sherds from Chamber One and 2 from the cairn on north side, all beautifully decorated. Two mouldings form a broad groove at neck and a narrower one near the middle. From the lower moulding the wall curves steeply to the base, which is 55 mms. in diameter. Fig. 3, p. 47, illustrates decoration and section from the partly reconstructed vessel. Estimated height 9 cms. Diameter at lip 19 cms. Biscuit hard, black in centre, chocolate brown on surface. Average thickness of wall 8 mms., mouldings 11 mms.; base 12 mms. Rim broken. Decoration consists of 5 rings of chevrons in false relief, interspersed with lines of fine comb technique,

horizontal at neck and centre of mouldings, diagonal between second and third rings of chevrons and discontinuous near base. Bold incisions on base suggest star design. Belfast Museum has a food vessel found at Killderry, Beragh, Co. Tyrone, of somewhat similar shape and also one from Ballycraigy, Co. Antrim, showing affinities in decoration. Sherds numbered P 70-P 79 in Belfast Museum



Giant's Grave, Kilhoyle—Reconstucted Food-Vessel.

Fig. 3.

Pot 7 is light brown in colour with fairly smooth surface. Biscuit hard with black central layer showing coarse grit. A cordon formed 15 mms. below rim where the sherd is 10 mms. thick. The sherds were scattered, 3 came from the cairn in front of facade, 3 from below the pavement in the Gallery and the other 12 from the First Chamber and west end of Gallery. Thickness of wall 8 mms. A few sherds, probably from the lower part of vessel, show finger nail decoration. Apparently a small food vessel. Sherds numbered P 80 to P 97 in Belfast Museum.

Pot 8 consists of twenty-five sherds of a large coarse urn. A rim sherd found in north-east corner of First Chamber, also 17 other sherds from other parts of same chamber. Seven from the Gallery, four from west end and three above pavement. Rim everted with heavy bevel inside and has double row of dab and draw lines both inside and out. One sherd is part of a deep neck, another seems to belong to a shoulder, while one is part of a splayed base. Biscuit coarse, with

large grits, light brown throughout, external surface polished. Average thickness 10 mms. The body is decorated with lines apparently forming triangles and lozenges. Probably Bronze Age. Sherds marked P 98 to P 122 in Belfast Museum.

Pot 9 appears to be an urn of the enlarged food vessel type. The twenty-seven sherds belonging to it were collected from the First Chamber. Colour light brown but varying somewhat. Poorly fired biscuit, black in centre, with coarse quartz particles. Thickness 9 mms. Plain rounded lip. Surface of base crumbly and much broken; 14 mms. thick. Body poorly decorated all over with much worn maggot like pattern. One sherd shows part of a cordon or moulding. Sherds numbered P 123 to P 149 in Belfast Museum.

Pot 10 is represented by one sherd of the neck of an urn from front of First Chamber. Biscuit hard, light brown surface, black layer in centre; 8 mms. thick. Lip slightly recurved. Decorated with herring-bone motif, apparently made with coarse comb. Chevron-design on lip. Sherd marked P 150 in Belfast Museum.

Pot 11 is from the extreme east end of the Gallery and consists of nine sherds of a large coarse and thick cylindrical vessel apparently of domestic ware. Estimated diameter 9 ins. Wall 10 mms. thick, broadening to 16 mms. at lip. Biscuit coarse and earthy with numerous sand grains. Surface uneven, greyish brown, with patches of sooty stains. Lip rounded with almost obliterated lines suggesting chevron decoration. Two holes 4·5 cms. apart and 5 mms. below lip have been perforated from the inside before firing. One is on the line of fracture. Diameter of remaining hole 6 mms. inside and 4 mms. outside. Their use is difficult to suggest as there is no sign of wear on their edges and they are situated too near the lip to have been of service for holding a carrying cord for such a heavy pot; nor would their use as steam holes be reasonable as the rim is such that a covering lid would not fit sufficiently tight to make them necessary. From time to time fluids from the pot had poured out through these holes and are still visible as an irregular carbonised stream down the wall. Sherds numbered P 151 to P 159 in Belfast Museum.

In addition to the sherds described there are 8 of indefinite shape marked P 160 to P 167 in Belfast Museum. Sherds P 160 and P 161 are from the cairn, 2 ft. west of entrance to First Chamber and 15 inches below turf level there; their dark layered paste is of fine texture throughout and 6 mms. thick. Sherd P 162 is small and of fine hard black material in layers containing quartz particles; from Gallery close to septal stone, 2 ft. 9 ins. below its top and 1 ft. 3 ins. north of corner of stone 11. Sherd P 163 is from Gallery, 1 ft. east of the west corner of stone 8 and 1 ft. 3 ins. below its top; biscuit black and layered somewhat like P 160 and P 161 but with light chocolate colour on outside; 6 mms. thick. Sherds P 164, P 165 and P 166 are from north-west corner of First Chamber, 2 ft. 9 ins. below top of septal stone; P 164 has biscuit of fine sandy texture, red throughout, with coarse quartz grains; P 165 and P 166 are somewhat similar but of a softer paste. P 167 is a small sherd of reddish material with black centre from First Chamber, 2 ft. 3 ins. in front of septal stone.

White Quartz.

Numerous white quartz pebbles were found in the cairn and chambers. Some were small, others 3 or 4 ins. in diameter and all showed irregular fracturing. Quartz is not common in the immediate neighbourhood but plentiful on the land to the west and south. Evidently these pebbles were not accidentally introduced to the cairn.

ANNUAL MEETING OF SOCIETY.

The Annual Meeting of the Society was held in the Old Museum Buildings on Tuesday, 1st November, 1938, when Professor T. Thomson Flynn, D.Sc., M.R.I.A., President, occupied the chair. Among those present were Colonel Berry, M.R.I.A., Messrs. W. B. Burrowes, F.R.S.A.I. (Hon. Treasurer), A. Albert Campbell, F.R.S.A.I., Alex. Davison, F.R.S.A.I., Godfrey W. Ferguson, F.R.I.B.A., J. W. Gillmour, J. T. Greeves, Professor W. B. Morton, M.A., D.Sc., Rev. R. Dixon Patterson, M.A., A. G. Pomeroy, M.A., Captain Turner, M.C., Captain J. R. Young, F.R.I.B.A., and A. Deane (Hon. Secretary).

Apologies for inability to attend the meeting were received from Dr. S. W. Allworthy, Rt. Hon. Samuel Cunningham, Dr. R. H. Hunter, Mr. R. S. Lepper, and Mr. Robert A. Mitchell.

The Chairman called upon the Hon. Secretary to read the notice convening the meeting. It was reported that the meeting had been also advertised in the local papers.

The Council submitted their report, which reads as follows:—

ANNUAL REPORT.

Your Council has pleasure in bringing before the Shareholders and Members the Annual Report for the 117th Session of the Society which ended on the 31st October.

Shareholders and Members.

Your Council regrets that the number of Shareholders and Members shows a falling off, largely caused by death and resignation. In the latter case, it is principally due to members now residing outside the city; and with the attraction of the radio and cinema there is not the same incentive to attend meetings in Belfast. The number of Shareholders and Members is now 181 as compared with 203 in the previous year.

Your Council hopes that every effort will be made on the part of members to increase the membership of the Society under the subscription scheme of 1914, whereby a person may be admitted on payment of ten shillings annually. An increase in membership would enable your Council to increase its activities, and in so doing to carry on the tradition of its earlier members.

No transfer of shares has been made during the year.

Your Council has had under consideration the question of increasing the Society's activities by the extension of the publication of original research by members and non-members. The Council invites the submission of suitable papers. Those by non-members must be communicated by a member of the Society.

Dean Carmody.

Your Council records, with deep regret, the death of the Very Rev. W. P. Carmody, M.A., M.R.I.A., Dean of Down, on the 4th March last. Dean Carmody was an Honorary Member of the Society and President in 1929-30. For some time he served on the Council and was for many years Chairman of the Society's Archaeological Section. Your Council has decided to procure a drawing of the Dean for the Council Room, the cost to be defrayed by private subscription. A memoir of the late Dean by His Hon. Judge H. M. Thompson, K.C., appears on pages 52-54.

Lectures.

Seven lectures were delivered during the past session covering literature, art, travel and natural history, and our thanks are due to the lecturers for their stimulating addresses.

Your Council is glad to report that they have arranged a series of lectures of special interest for the coming session, to be given by Professors and Lecturers of Queen's University.

Society's Representatives.

Dr. R. H. Hunter, one of the three representatives on the local Committee of the National Trust for Places of Historic Interest and Natural Beauty, resigned, and his place has been taken by Professor Gregg Wilson. Mr. E. E. Evans continues to represent your Society on the Ancient Monuments Advisory Council and Mr. E. J. Elliott on the Libraries, Museums and Art Committee of the Belfast Corporation. Your President represented the Society at the 150th anniversary of the Foundation of the Linnean Society held in London.

Exchange of Publications.

Your Council regrets the absence, through ill health, of Mr. W. M. Crawford, the Hon. Librarian. Many of the exchanging Societies have expressed their appreciation of the increased size of our Proceedings. During the year three new exchanges have been established: Natural Science Society at Ljubljana, Yugoslavia, Royal Physiographic Society at Lund, Sweden, and the Agricultural and Mechanical College at Stillwater, Oklahoma. The ordinary work of the library, acknowledgment of exchanges has been carried out as usual, as well as the distribution of publications between the Museum Library and the Library of Queen's University.

Council Members.

Five members are due to retire in rotation, in accordance with the Society's constitution, namely Colonel Berry, Mr. W. B. Burrowes, Rt. Hon. Samuel Cunningham, Mr. E. J. Elliott and Professor Gregg Wilson. The meeting will be called upon to elect five Shareholders or Members on the Council. All the retiring members offer themselves for re-election.

The Building.

The Society's Agents, Messrs. Davison & Dickey, report that the building has remained fully occupied by suitable tenants during the past year. The Women's Citizen Union, who rented the back room on the Ground Floor, left, but the room was let immediately to the Northern Drama League without any loss of time.

The condition of the premises is good. During the year the exterior of the building was painted. In the month of March last an incendiary bomb exploded near by, and caused much damage to glass, woodwork, and ceilings of Committee Room, and to the room occupied by the College of Nursing. Your Agents immediately lodged a claim for compensation. The claim was heard before the Recorder, who awarded the costs of repairing the damage to the Building. The rents received for nightly lettings amounted to £23 12s. 6d for the year. This is a great improvement on last year, and it is hoped that members will continue to make known the desirability of this central Hall for meetings and lectures.

Archaeological Section.

During the period covered by this report, the Archaeological Section has continued its activities in the Field, excavations having been carried out at Mourne Park and Sallagh Braes. To Moiry Castle urgent and necessary repairs have been carried out under the direction of Mr. Oliver Davies in order to preserve this ancient monument.

With the assistance from the Section an anthropological Survey in the Ballymoney district has been made possible.

Demonstrations were given in the Museum in January last by Mr. E. E. Evans and Mr. Oliver Davies on the specimens found in recent excavations which was much appreciated by the members present, while in the following month Colonel Berry opened a discussion on Megaliths.

The Section keeps in touch with recent archaeological thought in its association with the Congress of Archaeological Societies.

Your Council is glad to report the good work which has been accomplished by the Society's Archaeological Section during the year.

Financial Statement.

Your Hon. Treasurer, Mr. W. B. Burrowes, will place before you the financial statement of receipt and expenditure which will be audited by the Local Government Auditor, in accordance with the regulations of the Educational Endowments Act.

Mr. Burrowes said that the Society commenced the Financial Year with a debit balance of £119 2s. 3d., the overdraft at 31st October, 1938, amounting to £137 0s. 7d.—an increase of £17 18s. 4d.—which is partly due to a decrease in the rental from £200 8s. 8d. in 1937 to £187 0s. 8d. in 1938.

Owing to deaths and other circumstances the Membership has been affected, but it is hoped with new Members coming in this adverse balance will be reduced in the coming year.

A statement of the Receipts and Expenditure appears on page 57.

Adoption of Reports.

The President, in proposing the adoption of the reports, congratulated the Council on the success of the year's working, and appealed to individual members to try to interest their friends in the Society. He thought it a pity that in its 117th year, the Society should have a falling membership, and he was surprised that so many members of the University and kindred institutions should be unconnected with it.

Mr. J. W. Gillmour, who seconded, said he thought interest in the Society's activities was increasing with the growth of the city. They, as a Society, should not lose hope for there would always be a group of interested people to carry on the good work of the Society.

Election to Council.

The Rev. R. Dixon-Patterson moved, and Mr. J. T. Greeves seconded, the re-election of the following members to the Council for three years, namely: Colonel Berry, Mr. W. B. Burrowes, Rt. Hon. Samuel Cunningham, Mr. E. J. Elliott and Professor Gregg Wilson. The election was unanimous.

At the close of the meeting the Council met, when Professor T. Thomson Flynn was unanimously re-elected President.

OBITUARY.

Very Rev. W. P. CARMODY, M.A., M.R.I.A., Dean of Down.

Honorary Member.

William Patrick Carmody was born in County Waterford, and educated at Santry School and Trinity College, Dublin, but practically all his working life was spent in the North of Ireland.

A Sizarship and First Honours in Mathematics in Trinity qualified him for the easily entered profession of teaching, and it was as mathematical master that he came to Coleraine Academical Institution in 1889.

His social gifts made him many warm and attached friends in Coleraine, and there he decided to devote himself to the Ministry of the Church.

In October, 1892, he was ordained, and appointed to the curacy of the Parish of Layde, in the Diocese of Connor, of which the Rev. William Thompson was then Rector; and at Cushendall he laboured for the ensuing six years.

He was then and always an excellent parochial clergyman, taking a special interest in visiting his parishioners, endearing himself to them by his ready sympathy and understanding; and winning their confidence by his trustworthiness and practical wisdom.

In this he was greatly helped by his delight in ' character ' and his keen sense of humour. To the end of his days he preserved the kindest recollections of the people of the Glens of Antrim. There he met and married his wife, the third daughter of the Rev. William Thompson.

While at Cushendall he was first attracted to the study of archaeology and local history, and published a short but very excellent guide called " Cushendall and its Neighbourhood."

He was often heard to say that on the one hand he had never asked for any ecclesiastical preferment, and on the other hand had never refused any post in the Church which he was asked to undertake; and certainly he was called to many offices during the forty-six years of his ministry.

He was Rector of Connor 1898-1904; of Carrowdore 1904-1908; of Knockbreda 1908-1917; of Lisburn 1917-1923; and of Downpatrick and Hollymount 1923 until his death in 1938. In every one of these parishes he made his mark; every one of them he left with reluctance; and in every one of them his departure was regretted by many friends.

Almost every office in the gift of the Diocese or his fellow clergy was bestowed on him. He was Rural Dean of Hillsborough, Member of the General Synod, a Canon of Down Cathedral, a Canon of Connor, Diocesan Nominator for Connor, Member of the Diocesan Board of Education, Representative Canon of the United Diocese in St. Patrick's Cathedral, Dublin, and on his vacating that stall Chapter Canon of Castleknock in the same Cathedral, Examining Chaplain to the Bishop of Down, Commissary to the Bishop of Bendigo, Member of the Diocesan Court of Down, Diocesan Nominator of Down, Member of the Representative Body and Dean of Down.

Reproduced from a Sketch by Miss Eileen Ayrton.

Very Rev. W. P. Carmody, M.A., M.R.I.A.
Dean of Down,
President, 1929-30,
and Hon. Member.
Died, 1938.

In 1926 and 1929 he was Select Preacher before the University of Dublin, and at a later date (one of the honours he prized most) Select Preacher before Cambridge University.

The duties of all these Diocesan Offices he discharged with a quiet efficiency which justified the universal confidence which he inspired. He was, indeed, an excellent man of affairs, punctual and businesslike, clear headed and practical, but more than this he was eminently prudent and far seeing, fair minded and impartial, and above all sympathetic, loyal and dependable. He was a man of many friendships and of boundless hospitality in his professional life, and nothing gave him greater pleasure than to have his brother clergy gathered around him for a quiet Day of Meditation, or at his study fire for chat and merry jest. Here his social gifts, his keen sense of fun, his delight in humorous extravagance and whimsicality and his apt memory for anecdotes found their happiest outlet.

With men of other pursuits, too, his tact and ready sympathy, his versatility and wide range of reading, made him equally at home; the hundreds of letters of regret which followed his death were an index of the width and depth of his friendships.

His interest in local history, archaeology and genealogy which began in Cushendall increased with his years, and found at last the most absorbing of his extra-professional pursuits.

At Connor he came within the ambit of two distinguished archaeologists—Canon Grainger and Dr. Buick—and here he began a collection of flint implements and other objects of local interest which ultimately grew to embarrassing dimensions. He was among the early explorers of the prehistoric flint factories of Tievebulliagh from which Mr. Knowles, of Ballymena, gleaned so much.

A souterrain explored by him at Carncómb near Connor, Co. Antrim[1] was described by him in an article in which he drew attention to certain markings in two stones which were identified as Ogham inscriptions. One of the stones is now preserved in Kildare Street Museum, Dublin; the other is still in the covered up souterrain.

In all his parishes he devoted his leisure to a study of the local antiquities, and some of the fruits of these labours were embodied in such publications as the " History of Knockbreda " (1929)', " Lisburn Cathedral and its Past Rectors " (1923), and in numerous articles in various journals.

In 1925 he became a member of the Ecclesiastical Records Committee of the Representative Church Body, and when the Ancient Monuments Advisory Committee[2] of Northern Ireland was formed in 1926 he was nominated as Chairman, and remained Chairman until his death, during which time he did most valuable work on the many occasions when local knowledge and diplomatic skill were called for. He was recognised as an authority on the history and antiquities of Down and its Cathedral, and took pleasure in showing and explaining the Cathedral to the numerous parties which visited it.

He had accumulated much unpublished material concerning the County and Diocese of Down, much of which he had donated to the Down and Connor Diocesan Library and to the Representative Body, and he was in intimate collaboration

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(1) See *Ulster Journal of Archaeology*, vol. V, 1899, pages 47 and 105, *Journal, Royal Society of Antiquaries*, 1, vol. XXVIII, 1898, pages 392 and 397; vol. XXXII, 1902, page 239 ; and vol. XXXIII, 1903, page 116.

(2) Now designated a Council.

with Chancellor J. B. Leslie, D.Litt., and the Very Rev. Dean Swanzy during their compilation of their Biographical succession lists of the Dioceses of Down and Dromore respectively.

As an instance of his careful attention to detail it may be mentioned that he had for many years made a practice of cutting out and filing all newspaper notices of births, marriages and deaths connected with clergy of the Church of Ireland.

In 1927 he was elected a Member of the Royal Irish Academy, and afterwards became a Vice-President of that body.

He joined the Belfast Natural History and Philosophical Society on the foundation of its Archaeological Section in 1917, succeeding Sir Charles Brett as Chairman. He was admitted an Honorary Member in 1927, and reached the Presidential Chair in 1929-30.

When it was decided to start a new series of the *Ulster Journal of Archaeology* he was appointed Chairman of the Committee responsible for its conduct, and he saw this important undertaking safely launched in the last year of his life.

While not untinged with the critical attitude towards fellow-archaeologists which is not uncommon among the students of that pursuit, he was most appreciative of any work of genuine research and a ready helper of anyone who sought his aid. He took a leading part in the investigating and clearing of the important Monastic Settlement at Nendrum in Island Mahee and in the reinstating and preservation of the extensive ruins there.

His sermons, while not distinguished by eloquence, bore every mark of culture and wide reading, and were most carefully prepared. He was perhaps at his best in those concerned with some historical or biographical subject where his gifts of lucid exposition and earnest exhortation had free scope.

He was at all times an omnivorous reader and an insatiable collector of books. Not bookshops only but auction rooms and antique shops and the barrows on the quays of Dublin attracted his constant attention, and he seldom returned home without some new treasure " picked up for a song " to be exhibited with pride and crammed into his overcrowded shelves.

Old pamphlets, broadsheets, and early editions of books on local history—principally Irish of course—were his chief interest, and he left behind him a large and valuable collection of such works.

He had taken a leading part in the Commemoration in 1932 of the Fifteen hundredth anniversary of the coming of St. Patrick to Ireland, and especially in the notable Pageants held at Strangford and Belfast Castle; and in December of 1937 he was asked by the Ulster Tourist Development Association to write an article on St. Patrick which might be broadcast in America.

This was almost the last literary work he engaged in, and the broadcast when given attracted much attention.

His health failed rapidly from the beginning of 1938, and he died suddenly and peacefully on the 4th of March of that year.

He was buried in the ancient graveyard of Knockbreda Church.

HERBERT M. THOMPSON.

ANNUAL MEETING

OF

ARCHAEOLOGICAL SECTION.

The Annual Meeting of the Section was held on Thursday, 10th November, 1938, under the Chairmanship of Colonel R. G. Berry, M.R.I.A.

An apology for inability to attend the meeting was received from the Hon. Treasurer.

The members present were Miss Gaffikin, Messrs. A. A. Campbell, F. J. Cole, O. Davies, E. E. Evans, F. M. Greeves, R. S. Lepper, J. Skillen and S. D. Thompson, the Hon.Secretary of the Section.

The Committee submitted the following report:—

Annual Report.

It is with a deep sense of personal loss that your Committee record the passing, during the year, of the late Dean Carmody who, as ex-President of the Society, and later as our Chairman, by his charm of personality endeared himself to those who were privileged to be associated with him. His loss not only to the Society, but to Ulster archaeology, cannot be minimised nor indeed easily repaired. To his widow, family, relations and his hosts of friends we extend a full measure of sympathy, and share perhaps in a lesser degree their great grief.

Your Committee are gratified that the archaeological activity in the province of recent years is being maintained and that the Section, as heretofore, has continued to play a useful part.

The excavations which have been carried out during the year will be reported fully in the Society's Proceedings.

Congress of Archaeological Societies.

The Section continues its representation on the Congress, and as members of the Section will have seen from the reports recently circulated Northern Ireland occupies a prominent place therein. Mr. Evans, the Section's representative at the Congress last year, states: "The personal gain in renewing and establishing contacts with the leaders of the archaeological world is very valuable, and the delegate in turn is able to act as ambassador and publicity agent for his Society and his province. I was able to answer many enquiries about new activities in Northern Ireland."

Archaeological Survey.

A grant was made to Mr. Mogey, an undergraduate of Queen's University, Belfast, who states that with the assistance so afforded by the Section he has been able to complete a period of specialised training in anthropological methods and field work under Professor Walmsley, of the Anatomy Department of the University. With the assistance of grants from the Royal Irish Academy and Queen's University he has now embarked on the main work of studying the population groups of Northern Ireland, taking as his first centre Ballymoney

because of his own personal knowledge of the district and as it represents a static agricultural area. It is hoped that a preliminary report will be made available early next year.

A Demonstration with short talks by Mr. O. Davies, M.A., and Mr. E. E. Evans, M.A., on recent excavations and finds was given in the Belfast Museum and Art Gallery in the month of January, and in the following month Colonel R. G. Berry, J.P., M.R.I.A.., initiated a discussion on " Megaliths."

New Membership.

The appeal to members two years ago to assume responsibility for at least one recruit to the Section has not, it is feared, met with any great co-operation as the normal accretion of membership is not sufficient to meet the casualties of death, removal, etc. An increase of membership is vitally necessary if we are to continue playing an equal part with the rest of Ireland and other parts of the British Isles. We again appeal with confidence that the co-operation and support of all will be forthcoming in the endeavour to make the Section a real live force in the archaeological world.

The Annual Report was adopted.

The statement of the Section's Accounts which was put forward by the Hon. Secretary was approved, and appears on page 58.

THE ACCOUNT OF THE BELFAST NATURAL HISTORY AND PHILOSOPHICAL SOCIETY FOR THE YEAR ENDED 31st OCTOBER, 1938.

RECEIPTS.

To Subscriptions			£63 15 0
,, Dividends			13 5 6
,, Rents			187 0 8
,, Rebate of Income Tax			11 5 0
,, Miscellaneous Receipts :—			
Archaeology	£16 0 0		
Sundries	0 10 0		
		16 10 0	
,, Balance against Account on 31st October, 1938			137 0 7
			£428 16 9

Securities—£400 York Street Flax Spinning Co., Ltd., 4½% Debentures.

PAYMENTS.

By Balance as per last Account			£119 2 3
,, Rent, Rates and Taxes			19 15 10
,, Insurance			8 18 4
,, Salaries and Wages			46 0 0
,, Fuel and Light			37 18 7
,, Other Payments :—			
Printing and Stationery ...	£79 3 9		
Advertising	14 6 11		
Archaeology	56 17 10		
Lectures and Lanterns ...	23 13 0		
		174 1 6	
Sundry Expenses	£7 10 8		
Bank Charges and Interest	7 8 7		
Audit Fee	1 1 0		
Postages	7 0 0		
		23 0 3	
			£428 16 9

We certify that above is a true account.

E. J. ELLIOTT, Governor.

W. B. BURROWES, Accounting Officer.

18th day of November, 1938.

I certify that the foregoing Account is correct.

C. H. MACONKEY, Comptroller and Auditor-General.

9th day of December, 1938.

The Account of The Belfast Natural History and Philosophical Society given on preceding page is in the form prescribed by the Local Government Board. It includes the subscriptions and expenses of the Archaeological Section, separate account for which is as follows :—

ARCHAEOLOGICAL SECTION.

1937.							1937.				
Nov. 1	To Balance	...	...	...	...	£96 12 0	Nov. 15	By O. Davies (Island McHugh)	...	£7 18 10
1938.							1938.			
Oct.	,, Subscriptions ...	...	...	...	...	16 0 0	Feb. 12	,, E. E. Evans (Expenses London)	...	5 8 10
	,, Subsidy	...	...	...	...	8 5 0	Mar. 14	,, Liability Insurance	...	1 12 6
							,, 16	,, Postages (S. D. Thompson) ...	...	0 10 8
							April 9	,, O. Davies	...	8 10 11
							,, 30	,, Do.	...	1 2 2
							May 10	,, E. E. Evans	...	10 0 0
							Sept. 8	,, Do.	...	10 0 0
							,, 16	,, Northern Whig, Ltd. ...	...	0 10 0
							Oct. 11	,, O. Davies (Moiry Castle) ...	...	11 18 11
							,, ,,	,, Balance	...	63 4 2
						£120 17 0				£120 17 0

31st November, 1938.

W. B. BURROWES.

EXCHANGES.

*Publications received during year.

ABO—Publications of the Abo Academy.
*ALBANY—Bulletins of the New York State Museum.
*ANN ARBOR—Publcations of the University of Michigan.
*ATHENS—Publications of the Zoological Institute and Museum.
AUCKLAND—Reports of the Auckland Institute and Museum.

*BASEL—Verhandlungen der Naturforchenden Gesellschaft in Basel.
*BERGEN—Publications of the Bergen Museum.
*BERKELEY, CAL.—Publications of the University of California.
BERLIN—Publications of the Zoological Museum of Berlin University.
BIRMINGHAM—Publications of the Birmingham Natural History and Philosophical Society.
BLOEMFONTEIN—Publications of the National Museum of South Africa.
*BOSTON—Publications of the Boston Society of Natural History.
*BOULDER—Publications of the University of Colorado.
BRISBANE—Memoirs of the Queensland Museum.
BRUSSELS—Annals Societe Royale Zoologique de Belgique.
* ,, Bulletin Societe Royale de Botanique de Belgique.
BUENOS AIRES—Anales del Museo Argentino de Ciencias Naturales.
BUFFALO—Bulletins of the Buffalo Society of Natural Sciences.

*CALCUTTA—Publications of the Geological Survey of India.
*CAMBRIDGE, MASS.—Publications of the Museum of Comparative Zoology.
CARDIFF—Transactions of the Cardiff Naturalists' Society.
CHICAGO—Publications of the Chicago Academy of Sciences.
*CINCINNATI—Publications of the Lloyd Library and Museum.
*COIMBRA—Publications of the Zoological Museum of the University of Coimbra.
COLORADO SPRINGS—Publications of the Colorado College.
*COLUMBUS—Ohio Journal of Science.
* ,, Bulletin of the Ohio Biological Survey.
COVENTRY—Proceedings of the Coventry Natural History and Scientific Society.

DANZIG—Schriften Naturforschenden Gesellschaft.
DUBLIN—Proceedings of the Royal Dublin Society.

*EASTBOURNE—Transactions and Journal of the Eastbourne Natural History, Photographic and Literary Society.
EDINBURGH—Proceedings of the Royal Physical Society.
* ,, Proceedings of the Royal Society of Edinburgh.
* ,, Transactions and Proceedings of the Botanical Society of Edinburgh.
,, Proceedings of the Society of Antiquaries of Scotland.
*EXETER—Proceedings of the Devon Archæological Exploration Society.

Glasgow—Transactions of the Geological Society of Glasgow.
Gorlitz—Publications of the Natural History Society of Gorlitz.
Goteborgs—Handlungar Regia Societas Scientiarum et Literarum Gotoburgensis.

Halifax, N.S.—Proceedings of the Nova Scotian Institute of Science.
Hove—Annual Report of the Brighton and Hove Natural History and Philosophical Society, 1937.

Indianapolis—Proceedings of the Indiana Academy of Science.
Ithaca—Bulletins of the Cornell University Agricultural Experiment Station.

La Plata—" Manuferos Fossiles de la Republica Argentina."
*Lausanne—Memoirs and Bulletins de la Societe Vaudoise des Sciences Naturelles.
Lawrence—Bulletins of the University of Kansas.
*Lima—Memorias Sociedad de Ingenieros del Peru.
Ljubljana, Yugoslavia—Transactions of the Natural Science Society.
London—Publications of the British Museum (N.H.).
* ,, Quarterly Journal of the Royal Microscopical Society.
* ,, Publications of the British Association.
* ,, Proceedings of the Royal Institute of Great Britain.
* ,, Quarterly Journal of the Geological Society.
* ,, Publications of the Viking Society for Northern Research.
,, Reports of the National Trust.
Los Angeles—Publications of the University of California in Los Angeles.
*Lund—Proceedings of the Royal Physiographic Society at Lund.

*Madison—Transactions of the Wisconsin Academy of Sciences, Arts and Letters.
*Madras—Publications of the Government Museum, Madras.
* ,, Publications of the Madras Fisheries Department.
*Manchester—Journal of the Manchester Geographical Society.
*Melbourne—Proceedings of the Royal Society of Victoria.
*Montevidea—Archivos Sociedad de Biologia de Montevidea.
*Moscow—Bulletin de la Societe des Naturalistes de Moscow.

*Newcastle-upon-Tyne—Proceedings of the University of Durham Philosophical Society.
New Haven—Transactions of the Connecticut Academy of Arts and Sciences.
*New York—Annals of the New York Academy of Sciences.

Oslo—Publications of the University Library, Oslo.
*Ottawa—Publications of the Geological Survey of Canada, Department of Mines.
* ,, Publications of the Canadian Department of Agriculture.
Oxford—Proceedings and Report of the Ashmolean Natural History Society.

Padova—Atti dell Accedemia Scientifica.
Philadelphia—Proceedings of the Academy of Natural Sciences of Philadelphia.
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